This Week in STEEL

The Metalworking Weekly

June 15, 1959 Vol. 144—No. 24

Metalworking Outlook, p. 79

Technical Outlook, p. 141

Market Outlook, p. 181

▶ Listed on cover.

WHERE TO FIND

Index available semiannually.

STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Metalworking Pulse ▶

TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED JUNE 6	PREVIOUS WEEK	MONTH AGO	YEAR AGO
(1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies	173*	169	169	134

*Preliminary.

For the fourth time within a month, STEEL's index has climbed to a record. It exceeds the prerecession peak by 5 points. But with the steel contract deadline approaching, there aren't many more records in sight.

Details on Page 109

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED JUNE 13	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled	132,000*	126,298†	135,856	78,163
(Source: Ward's Automotive Reports.)	*Estimated.	†Preliminary.		

With the holiday effects out of the road, auto and truck output should return to pre-Memorial Day levels. May sales in excess of 500,000 cars guarantee another half million unit production month in June.

Details on Page 106

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED JUNE 14	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	2,681*	2,653	2,631	1,728
Index (1947-49=100)	166.9*	165.2	163.8	107.6
Percentage of capacity	94	94	95	64

*Estimated.

Steelmakers still encounter difficulties in lifting operations to desired levels. Output has fallen an average of 36,000 tons a week below scheduled rates for the last two months. The total, though, has set a record.

Details on Page 190

STEEL SCRAP PRICE COMPOSITE

	JUNE 10	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$35.50	$35.00	$33.33	$35.67

A $1 advance in the price of No. 1 heavy melting steel scrap at Pittsburgh and a 50 cent increase at Chicago lifted STEEL's composite 50 cents a ton to $35.50. This is a new high since the first week in April.

Details on Page 202

FINISHED STEEL PRICE INDEX

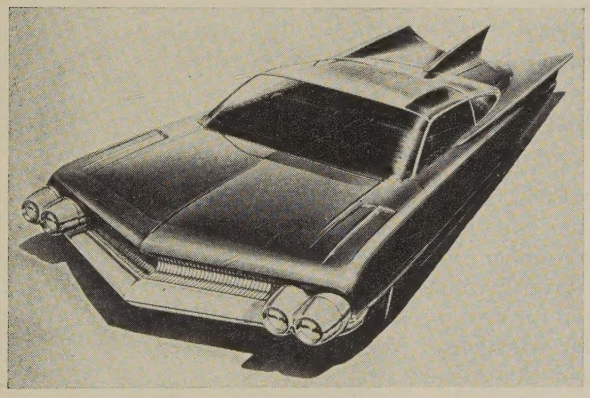
	JUNE 9	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.7	186.7	186.7	181.5

In view of the possibility of higher steel prices this summer, users are pressing for deliveries of June tonnages. Orders usually specify "price at time of shipment." Some deliveries are three weeks behind schedule.

Details on Page 191

Clip a Coupon to Win

In one of our original stories on the "Beat - the - Experts" contest, Detroit Editor Don Postma asked George W. Walker, Ford vice president and director of styling, what he would call his dream car rendering. Affable Mr. Walker (right) replied: "I suppose Canaveral, but let your readers name it." Among the names submitted: The Jasper, from Milton Hackett, Longview, Tex., ". . . something compact yet pleasing to the eye"; J. H. Quatmann, Cape Girardeau, Mo., likes Star Lestial; Visadream is from Edward H. Wheeler, Ambler, Pa.; and Triumph Americana is sent by Ralph S. Kinker, Machias, Maine. Full color prints of the car (below) will go to ten runners-up who "Beat-the-Experts" at estimating auto production in the U. S. from Jan. 1 through Dec. 31, 1959. The winner will receive a 1/10 scale model of General Motors' Firebird III. The contest closes at midnight, June 30.



Not with a Whimper . . .

In our May 4th issue, we told the world that austenitic manganese (Hadfield) steel, after shot peening, could spall under severe continuous loading.

"Not so!" says Norman A. MacLeod of La Habra, Calif., the inventor of explosive hardening. We quote: "I am interested in the article: 'This Part Is Hardened with Explosives,' pp. 84-85 of STEEL, May 4. May I point out that shot peening will never cause spalling as practiced commercially, even in ordinary steel . . . I did say that a heavy load could produce flow since the subsurface is still soft and unaffected by shot peening."

Thank you, Inventor MacLeod, for clearing up this point. We're thankful that a man with so much experience in handling explosives sent us an informative note instead of a package merrily ticking away in a plain brown wrapper . . .

How Judges Keep Impartial

Though it's not in the rules (because there aren't any), lots of readers have been sending along substantiation for names they submit in this department's "You Name It" contest. We don't allow as how we could be prejudiced by a few words, but here are some phrases from a New England reader that sound like they were recorded in one of the planning sessions which preceded the department's launching. We've edited the letter so his suggestion is deleted.

"Most of us read these pages in technical journals . . . to provide ourselves with a lift from the more serious, heavily concentrated reading of technical articles; we are looking for refreshment, and the informality and the conversational tone of the page provides it. At the same time, the editor is stepping down from his high plane of 'we' to the more informal 'Ed.' It reflects the approach of your publication to its readers. Your articles, artwork, and advertisements are your journal's character; your reader's page is your journal's personality."

Name It Soon

That's a fine slant on our thinking. Thanks for including it. The contest will run until midnight, June 23, so you still have time to send in a name. Remember, the winner will sport Honorary Editor card No. 1. After a brief spell of soul searching, we decided that the New England entrant would remain in anonymity, and his entry will stand on its merit without the letter to speak for it.

Who Said That?

The subject of anonymous letters has been cussed and discussed by editors for years. Here

---

I believe _____ automobiles will be produce
in the U. S. from Jan. 1 through Dec. 31, 1959.

Mail this to:
Beat-the-Experts
STEEL
Penton Bldg.
Cleveland 13,
Ohio

PRINT NAME _____
POSITION _____
COMPANY _____
ADDRESS _____
CITY _____

are a couple of cases in point.

We have a letter from a reader, who shall be nameless (because he initialed his letter TBF, for Truly B. Fuddled) asking Acton Chance:

"Who was going to pay the $67,000 taxes? Russians? (in 'The Case of the Vanishing Taxes,' STEEL, May 11, pp. 100-101). Why not award all domestic contracts at double the bid price and rake in the taxes? If the Navy will save $37,000 on every contract it places, our tax bill should drop a zillion bux. Yours, TBF."

We'd like to answer dear TBF thusly: "Ever hear of 'paper' savings? It's like 'paper' profits, only worse." Here's another example of the anonymous writer who deserves an answer, but we can't give one:

"Referring to STEEL for May 18th, first paragraph, p. 47, where David McDonald demands a four day, 32 hour week every four weeks. Why doesn't the press emphasize that this is another form of featherbedding? Sincerely, A. Reader."

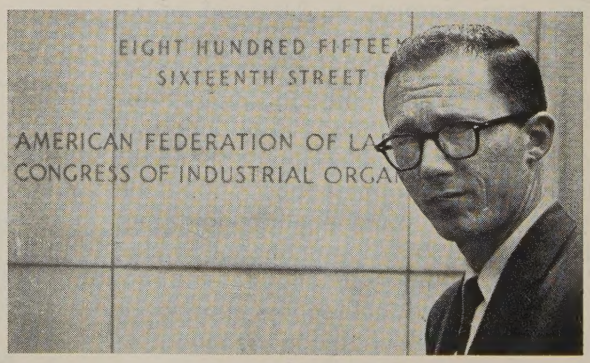
And We Reply . . .

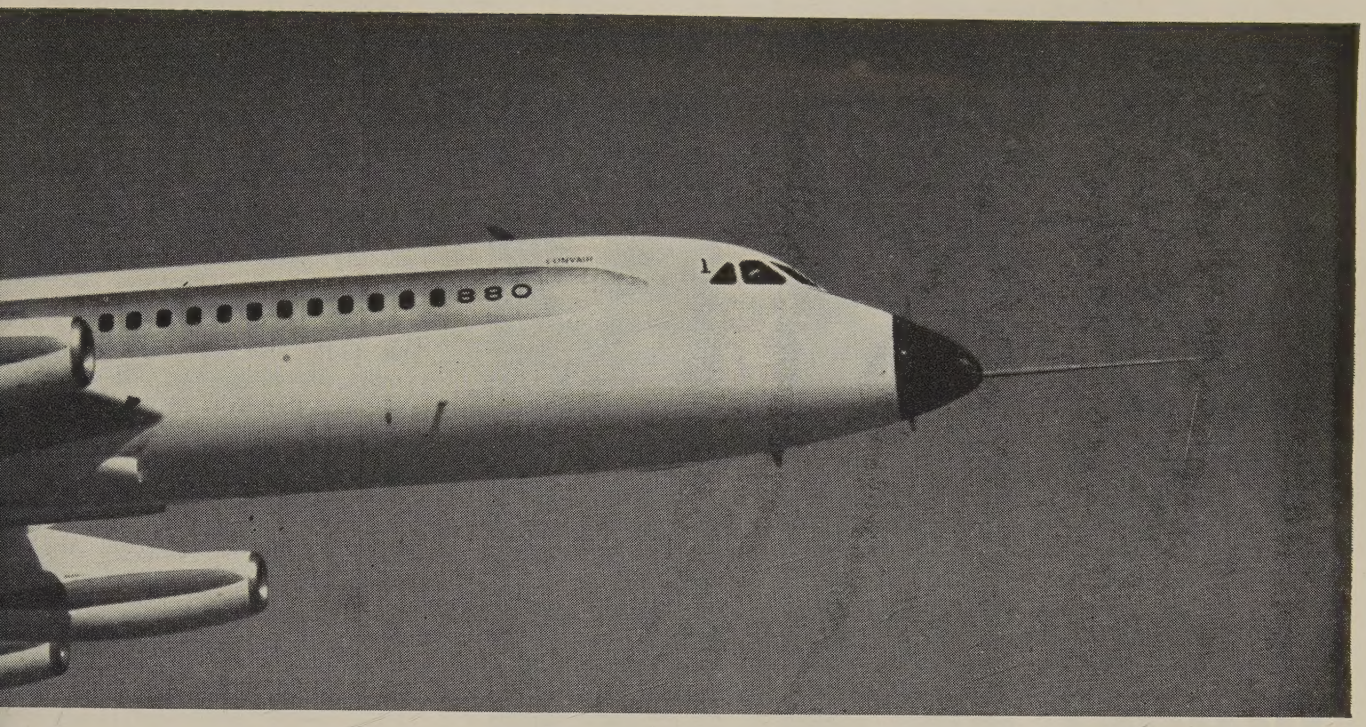
It's a matter of policy to refrain from publishing anonymous letters in STEEL. If you believe that your views will jeopardize your job, or some such, we suggest you send letters to us on your company's letterhead and include your name and title. We have to validate inquiries. If your letter is sufficiently compelling, and if you specifically request that we don't divulge your name, the letter will be published in anonymity.

Bluecollars Get Bleached

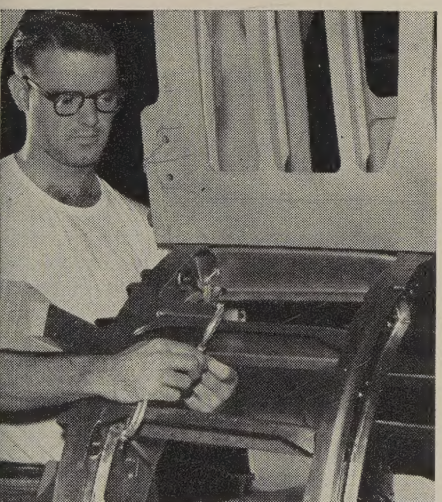
A few months ago, the U. S. Department of Labor disclosed that a decided shift had taken place in the American labor force. For the first time, the number of people in whitecollar jobs exceeded those in bluecollar jobs. While digging out material for next week's story, "Labor Recruits Whitecollar Members," Washington Editor Jack Botzum had this picture snapped in front of the AFL-CIO offices. Says Jack: "This serves to prove that not every editor gathers material by sitting in the National Press Club."

Jack also covered the offices of the USW, UAW, the Labor Department, and others, to round up a balanced story on these concerted drives.





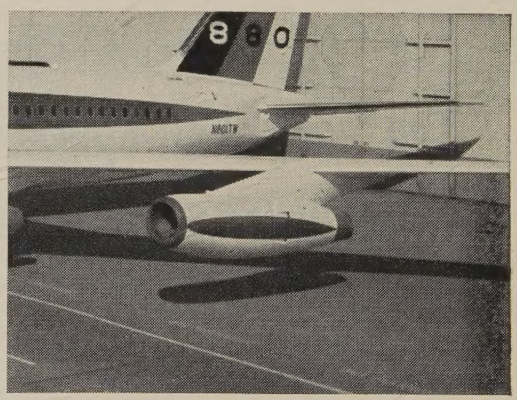
Metals for the 880



IN EACH 880 POD-PYLON, rear engine mount "horseshoe" frame — of nickel-plated, chrome-alloy steel — grips the powerful General Electric CJ-805-3 engine. Republic Alloy Steels offer exceptionally high strength-to-weight ratios with the highest strength values. Uniform response to heat treatment assures complete deep hardening penetration, plus hard, wear-resistant surfaces. Send for additional information.

REPUBLIC'S NEW HIGH-STRENGTH POWDER, TYPE HS6460,

is ideal for sinterings of highly stressed components. Provides minimum tensile strength of 60,000 psi at 6.4 density as sintered . . . 100,000 psi after heat treatment. Less than .004% shrinkage from die size at 6.4 density. Available in quantities up to and including 12 tons or multiples. Can be used with existing operating equipment. Mail coupon for technical data sheet.



MAJOR 880 TITANIUM USES are (1) fixed outboard nacelle assembly—107.8 pounds per nacelle, 215.6 pounds per airplane; (2) lip assembly anti-icing nose cowl—53.8 pounds per nacelle, 215.2 pounds per airplane; and (3) right hand access door assembly—41.2 pounds per nacelle, 164.8 pounds per airplane. Republic supplies a major portion of the 870 pounds of titanium that goes into each Convair 880.

REPUBLIC STEEL CORPORATION
DEPT. ST -7818
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Have a metallurgist call:	Send more information on:
☐ Alloy Steel	☐ Alloy Steel
☐ Stainless Steel	☐ Stainless Steel
☐ Titanium	☐ Titanium
☐ Type HS6460 Metal Powder	☐ Type HS6460 Metal Powder

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

STEEL

and Steel Products

CALENDAR
OF MEETINGS

June 15-17, American Nuclear Society: National meeting, Gatlinburg, Tenn. Society's address: 86 E. Randolph St., Chicago 1, Ill. Executive secretary: Octave J. Du Temple.

June 15-18, American Electroplaters Society: Annual meeting and industrial finishing exposition, Statler-Hilton and Sheraton-Cadillac Hotels, and Detroit Artillery Armory, Detroit. Society's address: 445 Broad St., Newark 2, N. J. Executive secretary: John P. Nichols.

June 16-19, American Marketing Association: National conference, Statler-Hilton Hotel, Cleveland. Association's address: 27 E. Monroe St., Chicago 3, Ill. Executive director: William C. Gordon Jr.

June 21-23, Alloy Casting Institute: Annual meeting: Homestead Hotel, Hot Springs, Va. Institute's address: 286 Old Country Rd., Mineola, N. Y. Executive vice president: E. A. Schoefer.

June 21-24, Drop Forging Association: Annual meeting, Essex and Sussex Hotels, Spring Lake, N. J. Association's address: Public Square Bldg., Cleveland 13, Ohio. Executive vice president: Dwight M. Allgood.

June 21-26, American Institute of Electrical Engineers: Summer meeting, Olympic Hotel, Seattle, Wash. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

June 22-23, Powder Metallurgy Parts Manufacturers Association: Membership and directors meeting, Skytop Lodge, Pocono Mountains, Pa. Information: Hanson & Shea Inc., 1 Gateway Center, Pittsburgh 22, Pa.

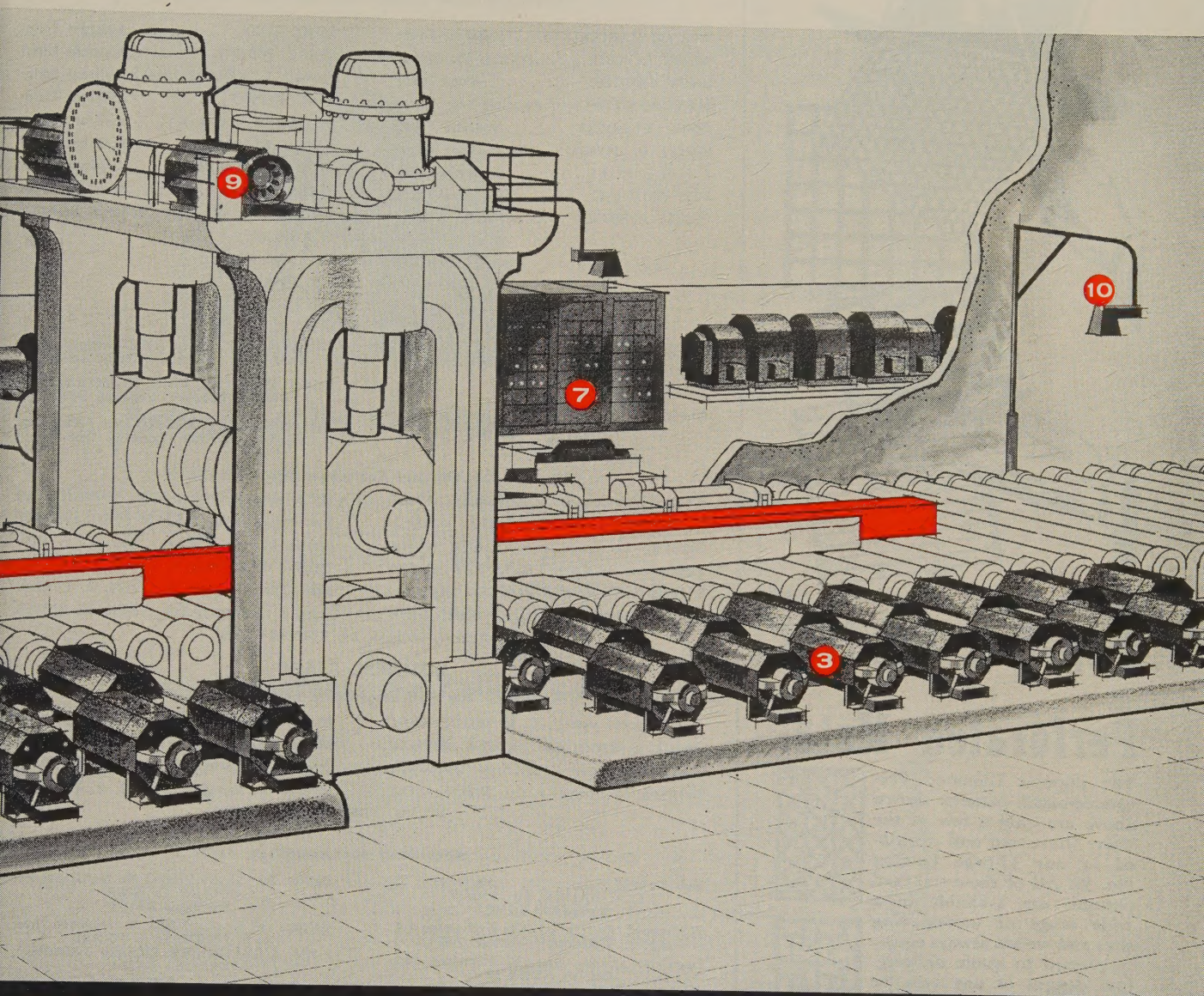
June 22-26, Air Pollution Control Association: Annual meeting, Hotel Statler-Hilton, Los Angeles, Calif. Association's address: 4400 Fifth Ave., Pittsburgh 13, Pa. Executive secretary: Harry M. Pier.

June 22-26, American Society for Testing Materials: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

July 13-15, Truck-Trailer Manufacturers Association: Semiannual meeting, Homestead Hotel, Hot Springs, Va. Association's address: 710 Albee Bldg., Washington 5, D. C. Executive manager: John B. Hulse.

July 29-Aug. 1, National Tool & Die Manufacturers Association: Summer board meeting, Grand Hotel, Mackinac Island, Mich. Association's address: 907 Public Square Bldg., Cleveland, Ohio. Executive vice president: George S. Eaton.

Implementation of General Electric's "Ring of the Future" will take you through the comparatively low-cost steps of modernization to practical automation of your reversing hot mill. Increased process and system efficiency will result in reduced operating costs. Greater speed and more precise control will minimize your non-productive rolling time, increase yield. For full information on Automation through Modernization, write today for General Electric's "Ring of the Future"* kit.



THE "RING OF THE FUTURE" KIT IS GENERAL ELECTRIC'S GUIDE TO AUTOMATION THROUGH MODERNIZATION.

*Copyright 1958, General Electric Company

TO: SECTION 804-2
GENERAL ELECTRIC COMPANY
SCHENECTADY 5, NEW YORK

Please send me G.E.'s "Ring of the Future" kit.

Name_____

Position_____ Company_____

Address_____

City_____ State_____

Automation Through Modernization

GENERAL ELECTRIC

STEEL
The Metalworking Weekly

Editor-in-Chief, IRWIN H. SUCH

Editor, WALTER J. CAMPBELL

Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY .....Market Editor
ROBERT F. HUBER .....Machine Tool Editor
HARRY CHANDLER .....Copy Editor
GLENN W. DIETRICH....Associate Copy Editor
FRANK R. BRIGGS .....Associate Editor
ROBERT O. JAYNES .....Associate Editor
AUSTIN E. BRANT .....Associate Editor
ROSS WHITEHEAD .....Associate Editor
GEORGE J. HOWICK .....Associate Editor
DERRY EYNON .....Assistant Editor
NEIL C. ROBERTS .....Assistant Editor
DONALD E. HAMMERSTROM..Assistant Editor
JOHN TERESKO .....Assistant Editor
WILLIAM M. OLDS .....Assistant Editor
MARY T. BORGERHOFF .....Assistant Editor
MARY ALICE EARLY .....Assistant Editor
EILEEN CORTES .....Assistant Editor
MARY ANN STUVE .....Editorial Assistant

JANE WEDGE, Editorial Assistant

THOMAS H. BRYAN, TOM WELSH, Art Editors

IRENE KASNER, Editorial Service

Resident Editors

New York 17 .....60 E. 42nd St.
B. K. PRICE, L. E. BROWNE
BRIAN WILSON
Murray Hill 2-2581

Chicago 11 .....520 N. Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 .....2837 Koppers Bldg.
WILLIAM V. WALLACE—Atlantic 1-3211

Detroit 35 .....15800 W. McNichols Rd.
A. DONALD POSTMA—Broadway 3-8150

Washington 4 ....1123 National Press Bldg.
JOHN R. BOTZUM—Executive 3-6849

Editorial Correspondents

Buffalo—Emerson 5385 ....GEORGE E. TOLES
Youngstown—Riverside 7-1471..GEO. R. REISS
Cincinnati—Beechmont 1-9607...DICK HAVLIN
Birmingham—Birmingham 3-1121 R. W. KINCEY
St. Louis—Garfield 1-1212. HAMILTON THORNTON
Houston—Hudson 6-5236 .....ROBERT SHIRK
Los Angeles—Webster 5-1234..NORMAN LYNN
San Francisco—Yukon 6-5151 EDWIN HAVERTY
Seattle—Melrose 2-1895 .....R. C. HILL
Toronto, Canada—Empire 4-9655..F. S. TOBIN
Birmingham, England .....J. A. HORTON
Brussels, Belgium .....PAUL DE KEYSER
Dusseldorf, Germany, DR. HERBERT GROSS

BUSINESS STAFF

Business Manager, D. C. KIEFER

Asst. Business Mgr.....C. A. TALLINGER JR.
Advertising Service Mgr. ...DORIS MITCHELL
Production Manager .....A. V. ANDERSON
Classified Advertising .....EVELYN DIETZ
Promotion Director .....S. F. MARINO
Market Research Mgr. ....T. M. BALLANTINE
Circulation Director .....J. C. GERNHARD
Distribution Manager .....G. R. EBERSOLE

Reprints, JUNE SCHILENS

Advertising Representatives

New York 17 .....60 E. 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2581

Wynnewood, Pa. (Phila.) 200 Wynnewood Ave.
WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. .....12 Farmstead Lane
CALVIN FISHER JR.
Orchard 7-1756

E. Rochester, N. Y. .....217 Ridgeview Dr.
HAROLD A. DENNIS—Browning 1-2105

Pittsburgh 19 .....2837 Koppers Bldg.
J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 .....Penton Bldg.
J. K. GILLAM, N. W. MANNING—Main 1-8260

Cincinnati 6 .....2215 Victory Parkway
E. L. FRANKE—Parkway 1-0711

Detroit 35 .....15800 W. McNichols Rd.
DONALD C. HYDE
Broadway 3-8150

Chicago 11 .....520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
WM. J. D'ALEXANDER, RICHARD BIRDSONG
Whitehall 4-1234

Los Angeles 36 .....5943 W. Colgate Ave.
F. J. FULLER—Webster 1-6865

San Francisco 4 .....57 Post St.
Robert W. Walker Co.—Sutter 1-5568

Griffin, Ga. .....1106 Pine Valley Rd.
FRED J. ALLEN—Griffin 7854

Clearwater, Fla. .....1954 Jeffords Dr.
H. G. ROWLAND—(Clearwater) 39-9493

Dallas 35 .....818 Exchange Bank Bldg.
JAMES H. CASH—Fleetwood 1-4523

BPA

ABP

NBP

Published Every Monday by
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, Ohio
MAin 1-8260

GEORGE O. HAYS .....Chairman
RUSSELL C. JAENKE .....President
FRANK G. STEINEBACH .....Vice President and Secretary
FRANK O. RICE .....Vice President
JOSEPH P. LIPKA .....Treasurer and Assistant Secretary

Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION
Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors, and National Business Publications Inc.

Metalworking's Capacity to Rise 2.7%

One in three metalworking plants will hike capacity in the coming six months, STEEL found in a survey of 6000 plant managers (Page 87). Manufacturers of instruments and related products and producers of primary metals will see the largest percentage gains in capacity. It doesn't mean an expansion boom this year, but it may signal the beginning of one. Metalworking lifted capacity only about 1.7 per cent during 1958's second half.

Employment Hits New High

Jobholders increased to a record 66 million in mid-May—a gain of 1 million in a month. The factory workweek rose to 40½ hours—highest May average since 1955. Unemployment fell by 240,000 in the month—12 times the normal seasonal drop. It stood at 4.9 per cent of the labor force—the first time it has been below 5 per cent since November, 1957. Expect unemployment to rise in June but don't look for it to hit 4 million again this year.

Growing Menace: Red China's Booming Industry

No laundry ticket, the markings at right spell "China's steel industry" and that spells trouble. You can expect Red China's production of capital goods to spiral 46 per cent this year and output of consumer goods to climb 34 per cent. "Production of several hundred million tons of steel within ten years is not impossible," says Hsueh Pao-ting, top economic planner. China's leaders admit the 1959 goal of 18 million tons of steel is far short of the needs of its 600 million people. But they claim last year's successes prove they can advance rapidly. Steel production rose from 5.4 million tons in '57 to 11.1 million tons in '58. Pig iron output climbed from 5.9 million to 13.7 million tons. Production of metal cutting machine tools soared from 10,000 units to 50,000. Goals for 1959: 18 million tons of steel, 23 million tons of pig iron, 75,000 machine tools (Page 99).

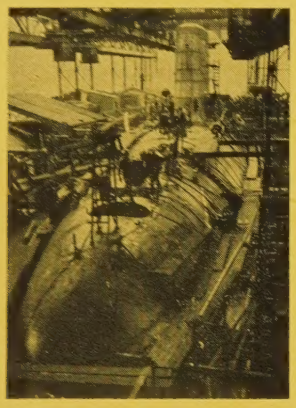
中國鋼鉄工業

Signs of Economic Times Spell Good Business

New orders for industrial supplies and machinery in April were only 1.4 per cent below the record set in March, reports the American Supply & Machinery Manufacturers' Association . . . New orders in April for foundry equipment were slightly below the March rate but still better than any 1958 month, reports the Foundry Equipment Manufacturers' Association . . . The

National Electrical Manufacturers Association predicts 1959 retail deliveries of air conditioners of 1.6 million to 1.75 million units—18 to 30 per cent better than last year's . . . Reynolds Metals Co. is boosting primary aluminum output to 100 per cent of capacity (601,000 tons) . . . Sales of investment castings will increase 20 per cent this year, predicts Investment Casting Institute . . . Sales of factory-built homes will pass the 135,000 mark for a record this year, reports the Home Manufacturers Association.

Who's Who in Atomic Submarine Building

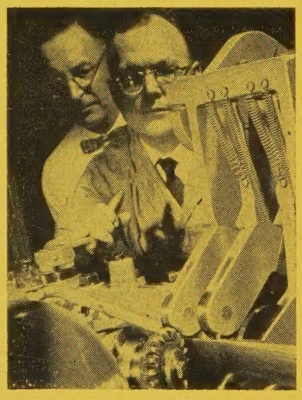


America's first Polaris-firing submarine, the *George Washington* (pictured), slipped into the Thames River at Groton, Conn., last week. It's our first fleet ballistic missile sub and means we can soon deliver a nuclear payload to virtually any target in the Soviet Union in a matter of minutes—without relying on the co-operation of any other nation. The *George Washington* carries 16 Polaris "birds" with a range of 1725 miles. It sets a new high point in destructive force. The sub market is a growing one for metalworking (Page 94).

You May Have to Finance a Strike Against Yourself

That's the implication of a Supreme Court decision made last week in a Ford Motor Co. test case. The decision allows collection of unemployment compensation by workers who must be laid off due to part shortages resulting from a strike in another state. Example: If the UAW struck GM's Central Foundry in Danville, Ill., causing shutdowns at many GM plants in other states, the idle workers could collect UC benefits.

GE Gets Set for the Sixties



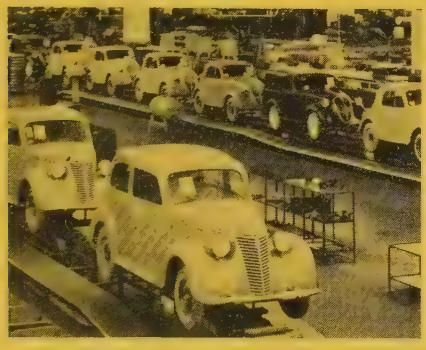
An array of new special machines will add more than 20 per cent to the capacity of General Electric Co.'s Large Steam Turbine-Generator Dept. at Schenectady, N. Y. (Page 92). They'll enable the department to turn out (annually) turbine-generator units with an output of 10 million kw (vs. 7.5 million before). Among the new equipment: A tape controlled milling machine (picture), a vertical stub-bar boring machine four stories tall.

Battle of Ogden Dunes Rages On

It looks like National Steel Corp. will be delayed for at least several more weeks from breaking ground for a new plant at Ogden Dunes, Ind. Porter County, which wants heavy industry in the area, has overridden little Ogden Dunes's prohibitive zoning regulations, but the town is appealing the ruling. A hearing will be held in La Porte County (after a change of venue) on National Steel's case. Another hearing on Inland Steel Co.'s case (it, too, owns land in the area) will come up later. Complicating the already com-

plex situation: Portage Township (pro heavy industry) is trying to incorporate within Porter County, but another little community is trying to block the move. And Sen. Paul Douglas (D., Ill.), whose Chicago area constituents like to picnic and camp at Ogden Dunes, is pushing a bill to create a national park there. Prediction: National will build a plant there but only after much costly delay.

SAE Looks at Foreign Competition, Cars of the Future



The Society of Automotive Engineers goes into session at Atlantic City, N. J., this week. It will hear about: Detroit's coming small cars going the economy-comfort route rather than the more austere European . . . eliminating spare tires to get extra trunk space . . . glass roofs . . . smaller engines and chemical fuels . . . simpler styling (Page 105).

Canada's Steelmen Feel Imports Too

The 2 per cent cut in British steel prices (effective June 1) is toughening foreign competition in Canada. British wire products were selling below Canadian prices on both seaboards before the reduction. But Steel Co. of Canada Ltd. says its chief battle is with Belgian and German steel, which is undercutting even the British prices. "Heavy tonnages" of bars, angles, and rounds are going into Canada, reports L. T. Craig, Stelco's vice president of sales. The opening of the St. Lawrence Seaway has definitely accelerated imports, he says. Look for more interest in British steel among U. S. steel consumers—especially if a strike causes shortages (Page 183). Some 23,000 tons of foreign steel entered three U. S. ports (Chicago, Detroit, and Cleveland) during the last week in May. Milwaukee, Buffalo, and Toledo are getting tonnages too.

Steel Strike Threat Brings Problems

You can't expect steel mills to operate at capacity right up to the strike deadline. Nor can you expect capacity operations to resume for at least a couple weeks after a settlement. Steelmakers must start slowing down output in the next few days and plan to halt production completely on June 29 (more than a day before the strike deadline) unless a clear agreement is reached. Reason: Prevent damage to producing facilities (Page 90).

'Right to Work' Gets Reverse Twist

Look for labor to take the initiative in next year's fight over banning the union shop. Union leaders figure efforts to kill the right to work laws in several states will bring out a heavy labor vote for the Democrats. Republicans have given little indication that they'll try to get the laws adopted in states that don't have them. Unionists aren't as much interested in killing the laws as they are in getting a prolabor Congress—one that won't enact

sweeping reforms, the thing union chiefs fear most. It's another reason for you to get more active in politics.

Shaped Materials Beat the Cost Crisis

Engineers at Rohr Aircraft Corp., Chula Vista, Calif., trimmed 20 per cent off the cost of making complex jet engine mounts by fabricating them from both standard and special shaped materials. Shown installed, the mount is made from six tailored forgings and pieces of bar and sheet stock. Other companies are finding that special shapes can cut manufacturing costs, sometimes trim material costs too. Check the factors on Page 142 that should influence your choice between standards and specials.

New Packaging Innovation: Color on Corrugated Cartons

You can now put four to six color pictorial reproductions on your corrugated containers, thanks to a new process developed by Progress Lithographing Co., Cincinnati. The firm expects the idea to catch fire as a marketing technique with makers of appliances, toys, sporting goods, tools, garden equipment, building materials, auto parts, and other items.

April Was Record Month for Manufacturing

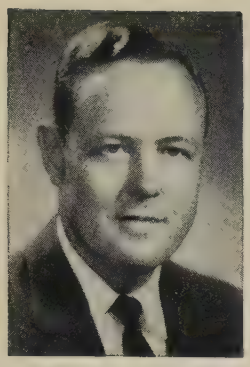
Manufacturers' shipments and new orders set records in April, reports the Department of Commerce. For the durable goods industries: Sales rose to $15.8 billion, up $3.9 billion from April, 1958; new orders hit $15.6 billion, up $4.7 billion; unfilled orders stood at $47.1 billion, up $3.1 billion.

Steel-Hungry Nations Seek New Ore Sources

Expect the huge iron ore deposits in the wilds of Quebec and Labrador to get more attention. At least 24 companies are trying to find a way to wrest the ore from the rugged Precambrian shield. Their activities range from exploration to advanced technical planning. Some are investigating the economics of shipping ore from Ungava via Greenland to world markets (to overcome the problem of a short Arctic shipping season in Hudson Strait). Others are concentrating on areas closer to the St. Lawrence River and the 360 mile railway from Sept-Iles, Que., to Schefferville, about 700 miles northeast of Montreal. Canadian officials predict that by 1965 Canada's iron ore shipments will reach 53 million tons annually vs. 20.7 million in 1957.

Straws in the Wind

Russia says it's building the world's largest blast furnace; it will produce 4500 to 5500 tons of pig iron a day . . . Renault is now the world's sixth largest producer of automobiles . . . Algoma Steel Corp. will build Canada's first wide flange beam mill; it's to be in production by late 1960 . . . Hertz Corp. may expand into the machinery rental business . . . Small business won $79.2 million worth of government contracts in April—$10.8 million more than in March . . . Use of aluminum foil combined with paper, film, and board will show a 50 per cent increase (to 150 million lb annually) over the next five years, says the Laminated Foil Manufacturer's Association.



How to Meet Foreign Competition

In practically any conversation among businessmen, the subject inevitably swings to foreign competition.

The challenge is formidable (see "Meeting Foreign Competition," Page 131). European and Japanese plants rebuilt since the war are modern and highly efficient. Their products are being marketed aggressively, not only in their home countries in competition with American products but in practically every other Western country, including the U. S.

In Latin America and Africa, there is a strong resurgence of nationalism and an urge to industrialize.

The European Economic Community (Germany, France, Italy, the Netherlands, Belgium, and Luxembourg) will eventually be a free trading area with external tariffs.

Seven other nations (Britain, Norway, Sweden, Denmark, Austria, Switzerland, and Portugal) are planning a similar economic unit which may eventually join the EEC in mutually reducing trade barriers.

Next year, 40 nations (including the U. S.) adhering to the General Agreement on Tariffs and Trade will meet in Geneva to negotiate reciprocal trade agreements.

With the emphasis on freer trade in the Western orbit, it is practically futile for any American company to expect relief from the U. S. Tariff Commission.

As a matter of fact, a growing number of American companies are becoming convinced that freer foreign competition is a good thing.

Abroad, they are serving their export markets through foreign-owned plants or licensees.

At home, they are attacking the problem through improved engineering, careful selection of materials, cost cutting production facilities, new and better products, and skillful marketing.

The problem of foreign competition will grow, not diminish, but it is not beyond solution. Faced squarely, it may not turn out to be the bugaboo many people believe it to be.

Irwin H. Such

EDITOR-IN-CHIEF

That's exactly what Inland's technical chefs will do when its giant, new sintering plant is completed in June. A single day's mix—4300 tons of iron ore particles, 500 tons of crushed limestone, 250 tons of fine coke—will bake a cake of clinkers which can be fed directly into blast furnaces. Result—better, faster reduction of raw iron ore to pig iron, blast furnace production upped 10%—*more and more Inland steel to feed the hungry production lines of fast-expanding Mid-America manufacturing!*

Building Today with an Eye to Tomorrow

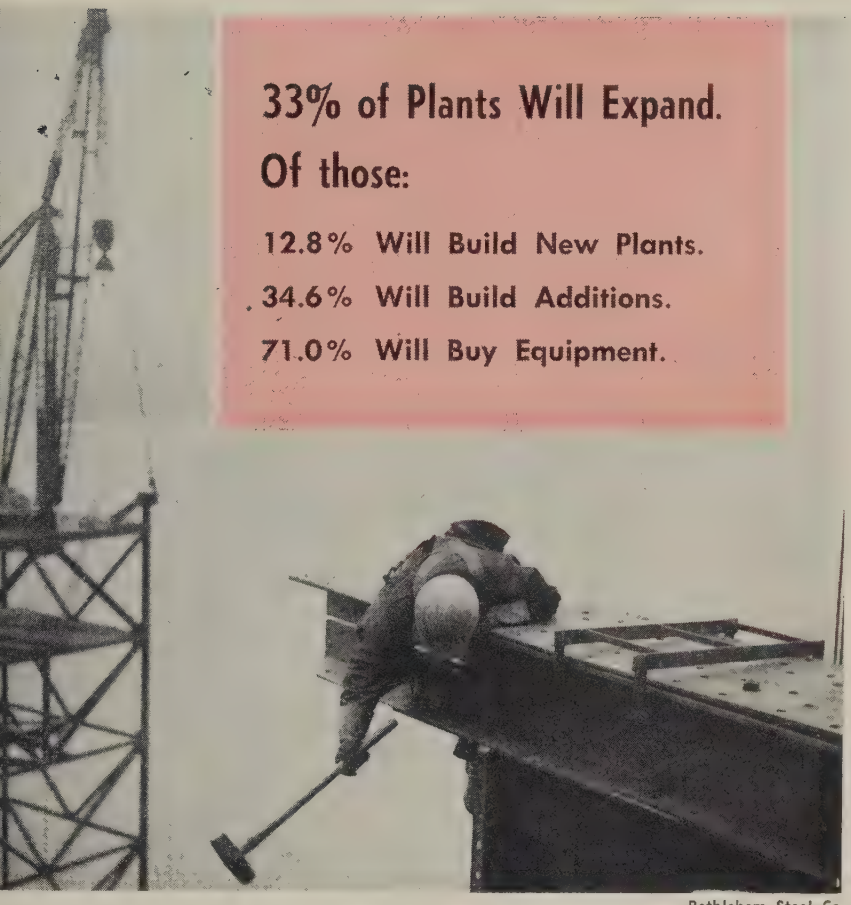
INLAND STEEL COMPANY

30 West Monroe Street • Chicago 3, Illinois

Sales Offices: Chicago • Davenport • Detroit • Houston • Indianapolis
Kansas City • Milwaukee • New York • St. Louis • St. Paul

Other Members of the Inland Family
JOSEPH T. RYERSON & SON, INC.
INLAND STEEL PRODUCTS COMPANY
INLAND STEEL CONTAINER COMPANY*
INLAND LIME & STONE COMPANY* *Division

Metalworking Capacity: Up 2.7% in 2nd Half



Bethlehem Steel Co.

NE IN THREE metalworking nts will boost production ca- city in the second half, STEEL nd in a survey of 6000 plant nagers.

t points up the optimism metal- rking management has regained the last six months. In a similar vey conducted last December, y 37.1 per cent of the plant man- rs said they would expand ca- ity during all of 1959.

Of those expanding capacity in second half, 7 in 10 will buy ipment; 1 in 3 will build plant itions; 1 in 8 will build plants. ne of the new capacity is com- as a side benefit as metalwork- buys new, more efficient equip- nt in its drive to lower unit pro- tion costs. Manufacturers of ma- al handling equipment and semi- omated production machines will their sales curves gain alti- e.

• **No Boom Yet** — Metalworking will not see an expansion boom this year—but the managers' optimistic forecasts may signal the beginning of one. Metalworking hiked capacity only about 1.7 per cent during the second half of 1958, so the gain in the coming six months will be a full percentage point better than the year-earlier mark. But you have to go back only to 1957's second half to find a better six month period. Metalworking lifted capacity about 4.5 per cent then.

• **But Some Solid Groundwork**—The most significant capacity increase is the 3.9 per cent planned by the primary metal industries. Steelworkers expect their operating rate to drop to around 70 per cent in the third quarter if there is no strike. So why expand? Steel company managers are looking ahead to the 1960s. They foresee soaring sales curves. So do aluminum producers. Some think U. S. consumption of aluminum will reach 4.2 million tons annually by 1965 vs. 2 million to 2.3 million tons this year. Few foundries are expanding now; they already have quite a bit of idle capacity. But many are mechanizing lines to lower production costs.

• **Despite Problems**—One of the biggest deterrents to the purchase of new equipment is the nation's outmoded tax structure. In fact, the managers named inadequate depreciation allowances as the number five problem facing metalworking today (after price competition, inflation, pressure for wage increases, and tax reforms in general).

• **Who'll Expand Most**—Manufacturers of instruments and related products will hike capacity the most. Here's how major industry groups rank and how much each will boost capacity in the coming six months:

Instruments, etc	5.1%
Primary metals	3.9%
Transportation equip.	3.6%
Electrical machinery	2.3%
Nonelectrical machinery	2.3%
Fabricated metal products	2.1%
Other metalworking	3.0%

• **Small Firms Optimistic**—Plants employing less than 500 will increase capacity 2.8 per cent; those employing 500 or more will hike it 2.1 per cent. More than 1 in 10 of the small firms will build new plants. One in three will build additions (vs. 1 in 4 for the larger plants). About 7 in 10 small plants will purchase equipment.

• **Who'll Buy Equipment**—Of the plants that will add capacity, here's how many will buy equipment:

Primary metals	84.6%
Instruments, etc.	75.2%
Electrical machinery	74.3%
Fab. metal products	17.7%
Transportation equip.	68.4%
Nonelectrical machinery	60.5%
Other metalworking	82.6%

For capital spending forecast, turn page

Plant & Equipment Spending Climbs Sharply

(Billions of dollars, seasonally adjusted at annual rates)

	1959		1958	
	July-Sept.	Apr.-June	July-Sept.	Apr.-June
Totals	**33.39**	**32.29**	29.61	30.32
Manufacturing	**12.82**	**11.95**	10.86	11.53
Durable goods	**6.31**	**5.75**	5.16	5.57
Primary iron & steel	**1.38**	**1.14**	1.20	1.27
Primary nonferrous metals	**0.34**	**0.37**	0.35	0.44
Electrical machinery & equip.	**0.52**	**0.50**	0.43	0.47
Machinery, except electrical	**1.01**	**0.88**	0.84	0.96
Motor vehicles & equipment	**0.70**	**0.61**	0.52	0.63
Transportation equip., except above	**0.42**	**0.37**	0.35	0.36
Mining	**0.97**	**1.02**	0.88	0.92
Railroads	**1.07**	**0.99**	0.63	0.77
Transportation, other than rail	**2.06**	**2.06**	1.29	1.40
Public utilities	**5.94**	**5.91**	6.10	5.97
Commercial & others*	**10.53**	**10.36**	9.85	9.73

*Includes trade, service, finance, communication, and construction industries.

EXPECT U. S. businessmen to spend $32.5 billion for plants and equipment this year—nearly 7 per cent more than they did last year. That's the prediction of the Securities & Exchange Commission and the Department of Commerce.

It means capital spending will come within 12 per cent of the record $37 billion spent in 1957. SEC-Commerce predicts businessmen will invest in plant and equipment at an annual rate of $33.39 billion in the third quarter. The agencies peg the second quarter rate at $32.29 billion (vs. $30.62 billion in the first quarter and $29.97 billion in 1958's final quarter). The capital spending decline reached its low point (a $29.61 billion annual rate) in the third quarter of 1958.

• **Metalworking's Pace**—Producers of durable goods are expected to spend more than $6 billion this year—about $550 million more than they did last year. They'll account for half the increase for manufacturing industries.

Primary iron and steel producers will spend $1.281 billion in '59 (vs. $1.192 billion in '58 and $1.722 billion in '57). The primary nonferrous industries will spend only about half as much as they did in '57.

Electrical machinery makers will show a gain of about 10 per cent this year vs. last, and the nonelectrical machinery people will spend about $34 million more this year than last.

• **Rails Start Climb**—The nation's railroads, suffering seriously from lack of capital, will nevertheless spend $867 million this year—$113 million more than they did last year. But they'll be far from their $1.4 billion peak in 1957. It is reported that the rails will scrap more freight cars than they'll buy this year. And 1 in 10 freight cars reportedly will have to be repaired this year. SEC-Commerce predicts the rails will invest at an annual rate of $1.07 billion in '59's third quarter—nearly double the rate in 1958's last quarter (when they hit their recession low point).

• **The Growingest Group**—Keep your eye on the big category labeled "commercial and other" (see table) by SEC-Commerce. The trade, service, finance, communication, and construction industries appear to be on the threshold of a building boom. They're preparing for the big sales gains they'll get with the family formation increases that are coming in the 1960s.

Cost conscious, expansion minded crowd seeks . . .

Lift from Material Handling

SALES of material handling equipment will increase some 60 per cent in the next ten years, predicted W. A. Meddick, president of Elwell-Parker Electric Co., as the Material Handling Institute's 1959 Exposition got underway at Cleveland last week.

He expects industry sales this year to be 15 to 18 per cent over last year's. Equipment builders displaying their wares were in accord. Gilbert W. Chapman, president of Yale & Towne Mfg. Co., told STEEL that incoming orders for the first five months were about 50 per cent ahead of last year's. He predicts that his company will probably establish a sales record this year.

Evidence of increased interest in handling was shown by a record 30,000 registrants. Elmer F. Twyman, senior vice president of Yale & Towne, says that users are making up for what they didn't purchase in 1958.

• Equipment builders have been preparing for expected sales increases through vigorous product development programs.

The result of their planning was evident. Probably more new equipment was on display than at any previous show.

Clark Equipment Co. introduced a 50,000 lb capacity straddle carrier that will transport and stack 8 x 8 x 24 ft shipping containers. It can drive over a string of railroad flatcars to remove a container from a middle car. Loads other than containers—steel plates, ingots, bales—can be stacked 8 to 12 ft high.

Nearly all truck builders exhibited narrow aisle models. Many showed trucks that can operate in low headroom areas and still stack high in warehouses. New drive systems were in evidence too.

New shapes in fork trucks were also in evidence. Yale & Towne introduced a sideloading model which can stack higher than 14 ft in minimum width aisles. Automatic Transportation Co. showed a fork truck which can move in any direction with any shaped load.

Barrett-Cravens Co. had four of its operatorless Guide-O-Matic tractors in operation, their movements programed on magnetic tape from a programing panel.

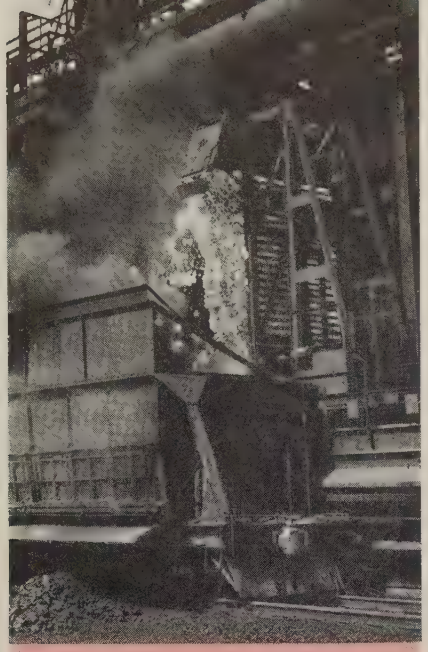
Automatic conveying systems were in abundance in monorail types and chain, cable, wheel, roller, and belt models. Rapids-Standard Co. devoted much of its display space to its new pressure sensing wheel conveyor. Columbus McKinnon Chain Corp. emphasized its Power-Flex power and free conveyor equipped with Telematic dispatch control which automatically guides a carrier.

Those are only a few of the new products exhibited. In all, 237 exhibitors displayed products in 40 major classes of handling equipment.

• The 1959 exposition may be the last national show sponsored by the Material Handling Institute. The association has announced a regional trade show program of at least four expositions for 1960 and '61.

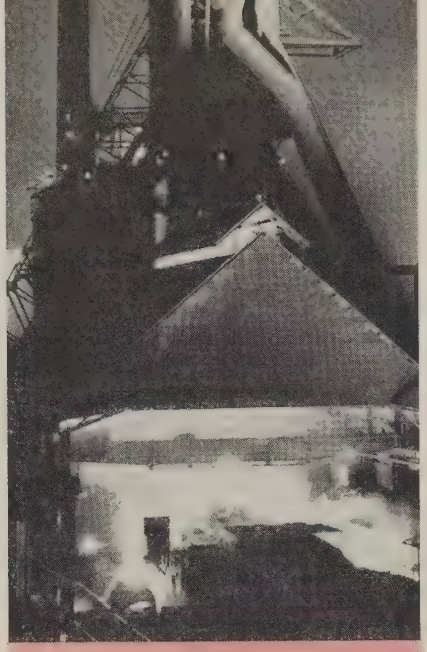
Prime reason for the change: To take the products to the markets, Robert F. Moody, chairman of the MHI expositions committee, told STEEL.

First of the regional shows will be in Commonwealth Armory, Boston, June 6-8, 1960. The Kentucky Fair & Exposition Center, Louisville, will house an exposition Nov. 8-10, 1960. A show will be held at the Cow Palace in San Francisco, Feb. 22-24, 1961. Philadelphia Convention Hall will be the scene of an exposition May 9-11, 1961. Mr. Moody said that MHI will not make any decision about a future national show until the results of the regional shows can be analyzed.



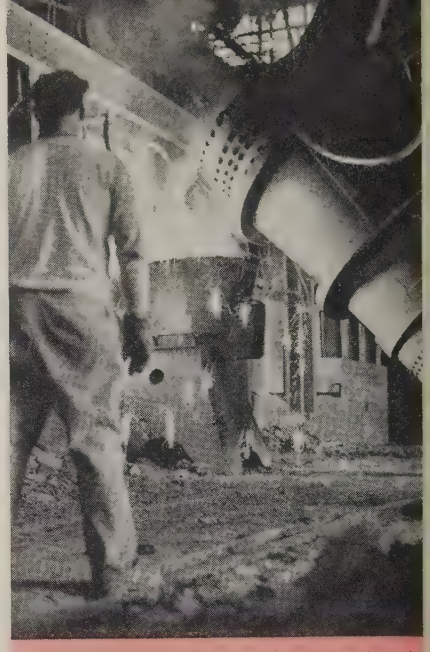
Coke Ovens

Last oven will be pushed 15 to 24 hours before strike deadline



Blast Furnaces

Eight hours of work are required to bank them



Open Hearths

Final heat must be charged more than 20 hours before deadline

Mill Shutdown May Start Within Days

STEELMAKERS must start slowing down output in the next few days and plan to halt production completely on June 29, more than a day before the strike deadline, unless a clear labor agreement makes it unnecessary to continue such a program to protect equipment and products. The precautionary measures must be initiated even though producers still hope to avert a general strike.

Pushing the last of the coke ovens, banking blast furnaces, and tapping final open hearth heats are the jobs to be done before a walkout, if it comes. Producers will be closing down processing lines day by day, moving out the specially finished products which would spoil in a long shutdown.

• Stopping coal supplies is an early chore in the winding up process.

Mines must be notified to halt shipments two to seven days before deadline, depending on mine-mill distance. Steelmakers will have to call their halts well in advance of the miners' annual holiday starting June 26.

• Timing the last open hearth heat is the critical shutdown factor.

The final heat will be charged into the open hearths more than 20 hours before strike deadline. In that time, the heat will be tapped, poured, and stripped of the ingot molds. Soaking pits, blooming mills, and slabbing mills can operate until the final hour. Ingots will be left in the pits to cool until operations are resumed.

If there's a strike, silica roof furnaces will be shut down and allowed to cool for the duration. Basic open hearths, however, must be fired with natural gas and maintained at about 1000° F. All metal has to be removed from the open hearths to keep it from "freezing" in the furnaces.

• Banking of coke ovens and blast furnaces will depend on open hearth schedules.

The last coke oven will be pushed some 15 to 24 hours ahead of shutdown; if some ovens are given a partial charge to maintain gas supplies and prevent damage to silica linings, they will be slowed to about 1800° F and the coking cycle stretched to 40 or 50 hours instead of the normal 15 to 18 hours. When ovens have been emptied, gas lines will have to be purged and coal chemical units cleaned of benzene, toluene, and other products.

• Banking blast furnace units takes 8 hours.

Some 10 hours before a furnace's last cast is tapped, a bank burden of coke and blanket of "wet ore" from 4 to 6 ft thick will be charged into the unit. This cap seals off the upward draft in the furnace. When the final cast is out, tuyeres are removed from the furnace and their openings plugged with clay, backed by sand. The openings are then bricked up to prevent combustion in the sealed furnace.

End of Line

Ingot molds are stripped 4 to 6 hours after pouring

Finally, the furnace bosh is spray coated with a fireclay or water glass mixture, sealing air off from the cooling, contracting brick. The operator may also force steam into the top of the furnace to form a back pressure above the ore cap.

During a walkout, standby employees are needed to maintain gas supplies to ovens and open hearths, and water supplies for cooling systems and plant fire hydrants.

• When operations are resumed, returning crews face a laborious and dangerous job.

Coke ovens will be ready for charging about 4 hours after they are fired; the first push will be made about 24 hours later.

Unsealing and rebricking blast furnaces may require 16 to 24 hours. Then, air can be introduced and hot blast stoves started. Another 16 to 20 hours will elapse before slag is molten and flowing to heal breaks in the furnace. Then 12 hours more will elapse before hot metal will be ready for the open hearths.

Initial open hearth heats are started with high quality scrap. The charge must be heated about 24 hours before the first tap can be made. The first steelmaking is a touch and go process of adjustments which may go on for a week.

Why is starting up dangerous? An operations manager explains: Open hearth roofs may collapse suddenly; a blast furnace "breakout" may occur where hot metal meets water or cooling fixtures; metal may explode if it hits moisture in a ladle.

Supervisors keep careful head counts of their crews so accidents will be discovered quickly.

In all, repairs to equipment and starting production will take two weeks or more. In 1952, the industry attained 42 per cent of capacity production in the first week after the 58 day strike ended. In the second week, production was up almost to a 90 per cent rate; the last 10 per cent is the hardest to get, steelmakers say.

Will Ike Enter Steel Talks?

NOT DIRECTLY—now.

Until June 30, look for the President to confine any direct action about the steel labor situation to press conference appeals for "statesmanship" by both sides. Behind the scenes, he and his staff will try to persuade management and labor to settle.

• But odds are that even the Presidential prestige will not bring a peaceful settlement of the steel dispute.

President Eisenhower will increase his behind-the-scenes pressure for a steel pact as the expected strike progresses. If the walkout lasts six weeks, he'll consider asking for the 80-day cooling off period provided for in the Taft-Hartley Act.

Intervention may come from other branches of government, too. Nine Senate Democrats have invited United Steelworker President David McDonald to give them a report on the negotiations today (June 15). U. S. Steel Corp.'s chairman, Roger Blough, will report to them next Monday, June 22.

• The steel companies want to avoid government intervention, and the union isn't keen about it either.

It's about the only point both sides agree upon currently. And fear of more direct U. S. action is the most potent force for peace in steel labor.

• The two sides are still far apart but may be getting closer.

Last week the union presented a long list of proposals, but no money cost on any of them and was vague on many. Industry's estimates of the expense of the demands range from 75 cents to $1.60 an hour.

The industry for the first time indicated it would change its extend-the-contract stand if the USW would accept an eight-point program to allow steelmakers to be more efficient.

The 12 individual teams from the big steel companies in the wage case will reassemble in New York tomorrow to try to get negotiations off dead center. Some people last week were deducing from this development that a selective strike is more likely. Analysis: Still possible, but not probable.

Both sides continue to take their cases to the public to a degree never before practiced. It disturbs some government officials. Labor Secretary James Mitchell called on the negotiators to quit haggling publicly.

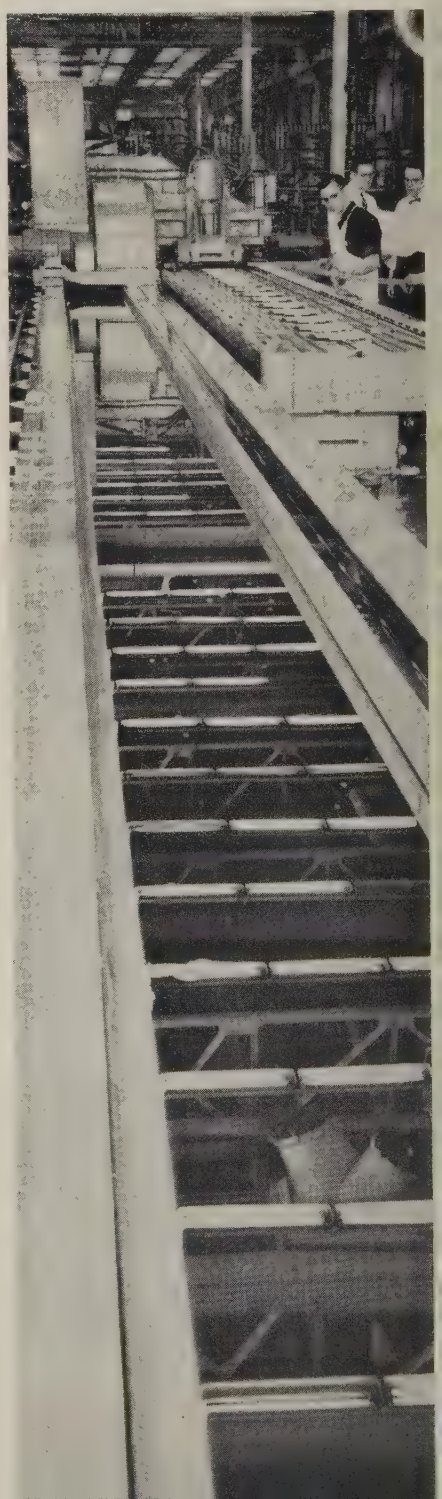
April Strike Toll Rises

National strike activity followed a rising seasonal pattern in April, with 350 new strikes taking out 175,000 workers. A carryover of 125 stoppages from March raised the total April strike idleness to 2.5 million mandays.

Strikes in the first four months of this year have totaled 1025, an increase over 1958 but below levels in other postwar years. More workers were involved in stoppages during the 1959 period than in any of the three previous years. Total strike time in this period, including that of several large stoppages which have continued from 1958, mounted to 7 million mandays, or about one-fifth of 1 per cent of all working time.

Turbine buckets up to 72 in. long can be profiled on the above tape controlled milling machine. Built at Ex-Cell-O Corp., Detroit, it is one of four. The machines, worth about $1 million, give the designer more freedom because nearly any shape can be profiled. They will also cut manufacturing leadtime and result in more efficient turbines, say GE officials

A unique application of automation to a job shop, the machine (below) does 250 operations on generator conductor bars, which average 19 ft in length. Built by Simmons Co., Albany, N. Y., the machine has six heads, each guided by punched cards. The heads move in turn down the length of the bar. Operations include wire brushing, inserting and welding passage plugs in place, machining ports and tapers, and deribbing. The machine's ways are 90 ft long



GE Bets Millions On Power Boom

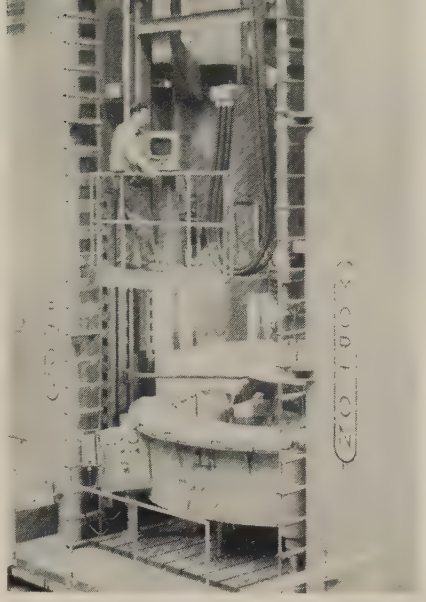
That's the amount of money management has invested in 19 new machine tools for the company's Large Steam Turbine-Generator Dept. Five are numerically controlled

AN array of newly installed special machine tools has added more than 20 per cent to the capacity of General Electric's Large Steam Turbine-Generator Dept. at Schenectady.

Discussing the machines at a press conference last Thursday, Herman R. Hill Jr. said the department can now turn out (annually) turbine-generator units with an output totaling 10 million kw. Mr. Hill, the department's manager of manufacturing, pegged the previous peak at about 7.5 million kw.

The new machines, most of them tailored to GE's requirements, are part of a continuing expansion program. Mr. Hill estimates that in the next ten years, "we'll have to produce as much as 16 million kw worth of units in a year."

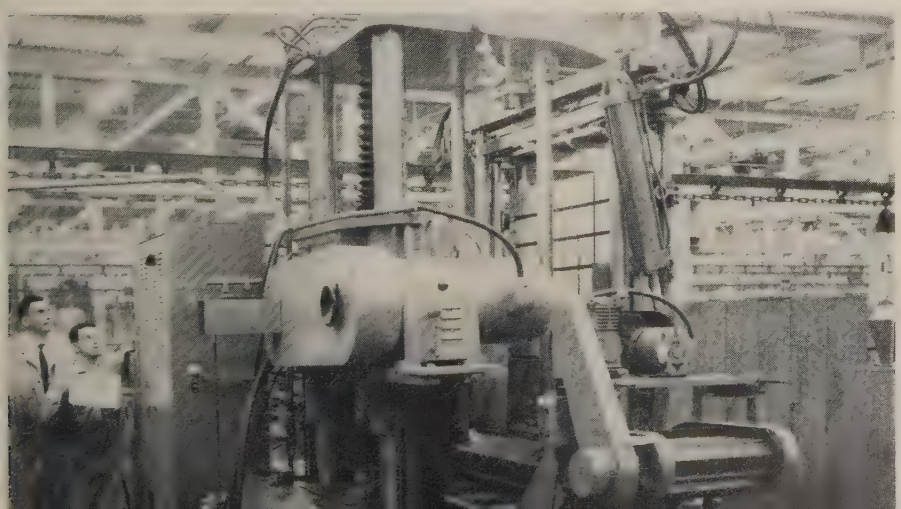
W. W. Kuyper, the department's manager of manufacturing engineering, (see Page 155) says that all the machines represent a joint effort in conception and design between General Electric and the machinery builders. As a reward: "We are getting our congratulations (in the form of) more efficient operations."



Tall as a four-story building, the vertical stub-bar boring machine (at right) works on 20 ton turbine shells. The operator rides on an elevator —watches the tool in the cut through a closed-circuit television hookup. The machine, built by Morton Mfg. Co., Muskegon Heights, Mich., cost more than $1 million. It uses numerical control to establish both the vertical and radial positions of the tool

This 28 ft long drilling machine, guided by tape, will drill and ream more than 2700 holes in generator rotors that weigh as much as 90 tons. Built by Baker Bros. Inc., Toledo, Ohio, the machine (above) has a four-faced turret, each face having a removable head with five spindles. The machine can drill one hole at a time, or five at a time; it can be set up for tapping or for tangential milling. The machine, costing about $500,000 to build and install, handles the work formerly done on conventional radials and horizontal boring mills

Drilling holes in plates as thin as ⅜ in., or stacked as thick as 10 in., the numerically controlled machine (below), built by Walter P. Hill Inc., Detroit, will put up to 2000 holes in each piece. In addition to drilling, the machine, as directed by punched tape, also reams and chamfers. Drilling speed is 8 to 10 in. a minute. Chips are taken out by a conveyor. The machine is 15½ ft long



Study Radioactivity Use in Steelmaking

RADIOACTIVITY'S use in steelmaking is being surveyed by Nuclear Science & Engineering Corp., Pittsburgh.

It will work under a one year contract awarded by the American Iron & Steel Institute.

The project will include studies with such firms as U. S. Steel Corp., Jones & Laughlin Steel Corp., Youngstown Sheet & Tube Co., National Steel Corp., and Crucible Steel Co. of America. Senior staff members of NSEC will visit the companies to find out where new or improved methods may be needed.

They'll discuss the use of radioisotopes and nuclear techniques in production or quality control, automation, inventory control, pilot plants, and development operations.

• **Possible Uses**—Operations to be studied may include: 1. Thickness and height gaging for solids and liquids. 2. Rolling speed control. 3. Control of melt heats. 4. Bar or ingot identification. 5. Scrap identification or analysis. 6. Raw material analysis. 7. Control of pickling baths with respect to impurities or activity. 8. Control of coating or plating thicknesses. 9. Industrial waste disposal problems. 10. Rapid procedures for melt analysis during heat processes. 11. Detection and characterization of imperfections on internal surfaces of tubes. 12. Instrumentation for process automation in the above areas.

Other problems in the development of new or improved products which may be investigated are these two:

Identification and distribution of inclusions and their sources of non-segregated impurities and their sources, and the recovery of raw materials from industrial wastes.

The AISI contract is one of the first to be awarded by private industry for the study of industrial uses of radioactivity. Prior studies have been sponsored mainly by the Atomic Energy Commission through its program for development of isotopes.

Who's Who in Nuclear Submarines

In Commission

Name and Type	Length	Displacement	Commission Date & Builder
Nautilus—Attack	320 ft	3180 tons	1954—General Dynamics Corp
Seawolf—Attack	330 ft	3260 tons	1957—General Dynamics
Skate—Attack	268 ft	2360 tons	1957—General Dynamics
Swordfish—Attack	268 ft	2360 tons	1958—Portsmouth, N H (Navy)
Sargo—Attack	268 ft	2360 tons	1958—Mare Island, Calif (Navy)
Skipjack—Attack	252 ft	2830 tons	1959—General Dynamics

Launched

Seadragon—Attack	268 ft	2360 tons	1959—Portsmouth (Navy)
Triton—Radar Picket	447 ft	5900 tons	1959—General Dynamics
Halibut—Guided Missile	350 ft	3555 tons	1959—Mare Island (Navy)
George Washington—Fleet Ballistic Missile	380 ft	5600 tons	1960—General Dynamics

Under Construction

Scamp—Attack	252 ft	2830 tons	1960—Mare Island (Navy)
Scorpion—Attack	252 ft	2830 tons	1960—General Dynamics
Sculpin—Attack	252 ft	2830 tons	1960—Ingalls Shipbuilding Corp
Shark—Attack	252 ft	2830 tons	1960—Newport News Shipbuilding & Drydock Co
Snook—Attack	252 ft	2830 tons	1960—Ingalls
Thresher—Attack	252 ft	2830 tons	1960—Portsmouth (Navy)
Permit—Guided Missile	278 ft	3747 tons	1960—Mare Island (Navy)
Pollack—Guided Missile	278 ft	3747 tons	1960—Ingalls
Plunger—Guided Missile	278 ft	3747 tons	1960—Ingalls
Tullibee—Hunter-Killer	260 ft	2175 tons	1960—General Dynamics
Patrick Henry—Fleet Ballistic Missile	380 ft	5600 tons	1960—General Dynamics
Theodore Roosevelt—Fleet Ballistic Missile	380 ft	5600 tons	1960—Mare Island (Navy)
Robert E. Lee—Fleet Ballistic Missile	380 ft	5600 tons	1960—Newport News
Abraham Lincoln—Fleet Ballistic Missile	380 ft	5600 tons	1960—Portsmouth (Navy)

Contracts Awarded

Barb—Attack	252 ft	2830 tons	not set—N.Y. Shipbuilding Corp
Haddo—Attack	252 ft	2830 tons	not set—N.Y. Shipbuilding
Jack—Attack	252 ft	2830 tons	not set—Portsmouth (Navy)
Tinosa—Attack	252 ft	2830 tons	not set—Portsmouth (Navy)
Dace—Attack	252 ft	2830 tons	not set—Mare Island (Navy)
Ethan Allen—Fleet Ballistic Missile	380 ft	5600 tons	not set—General Dynamics

Authorized

SSB 609—Fleet Ballistic Missile	Contract Not Awarded
SSB 610—Fleet Ballistic Missile	Contract Not Awarded
SSB 611—Fleet Ballistic Missile	Contract Not Awarded

Sources: U. S. Navy, Electric Boat Div. of General Dynamics Corp.

Program

USS GEORGE WASHINGTON, America's first Polaris-firing submarine, slipped down the ways into the Thames River at Groton, Conn., last week.

It's our first fleet ballistic missile submarine and means America can soon deliver a nuclear payload to virtually any target in the Soviet Union in a matter of minutes.

Our mushrooming nuclear sub fleet now breaks down like this: Ten have been launched. Six are in commission. Three more will be commissioned this year, and 15 will go into commission next year (see list on Page 94).

• **Fire Power**—The *George Washington* will carry 16 Polaris "birds" with a range of 1500 nautical miles (1725 land miles). Each is armed with a thermonuclear warhead. They give the *George Washington* destructive power equal to all the bombs dropped by U. S. planes in World War II. Putting it another way, its capacity for destruction is greater than the total firepower of the U. S. Navy between the Revolution and World War II, says General Dynamics Corp., whose Electric Boat Div. built the *Washington*.

• **Vital Statistics**—It's 80 ft longer than a 100 yd football field, 32 ft wide, and has a displacement of 5600 tons. It ranks only behind the *Triton* (STEEL, Aug. 25, 1958, p. 50), as the largest unit in our nuclear sub fleet.

Construction required 2260 long tons of steel, and thousands of pounds of aluminum, copper alloys, lead, and other metals. It required 70 miles of cable, 24 miles of pipe, 118 electric motors, 67 tons of weld metal, and 3300 separate plans. General Dynamics issued 40,000 purchase orders to subcontractors and sent 340,000 material requisitions to the Electric Boat Div. storehouse. Its cost will approach $100 million.

• **Firsts**—The *George Washington* will manufacture its own oxygen with an electrolytic generator.

It will be the first submarine to have three separate navigational systems and special stabilizing equipment. One indication of its complexity: More than 100,000 electric connections are found in the missile control center alone.

The *George Washington* will also be the first vessel to have two complete crews. They'll rotate about every three months. Purpose: To keep the ballistic missile subs constantly at sea, poised for action.

Plot Your Productivity Gains

YEAR-BY-YEAR productivity gains are plotted in advance, like plant improvements and new facilities, at Westinghouse Electric Corp. You can use the technique to chart your way into a growth position in the sixties. Here are some tips which were given before the American Society of Mechanical Engineers by George W. Jernstedt, manager of Westinghouse's headquarters manufacturing planning.

Westinghouse believes the average industrial manufacturing plant must have a 3 to 5 per cent productivity increase annually to hold its own. This means: With inflation driving up employment and material costs, the successful organization will have to do better than 5 per cent.

A twofold program for increasing productivity and physical growth is based on these guides: 1. Planning assumes that the output of a plant can be increased 3 per cent per year with continual planning and normal improvements in equipment and use of materials. 2. Improvement in productivity above 3 per cent must be obtained by major changes in product, or method, or facilities, or a combination.

• **Raising manufacturing productivity is the job of three different functional groups: The line group, control group, and planning department.**

The line organization is charged with maintaining employee efficiency at a reasonable level and applying an organized effort to improve the indirect, or managed cost, area.

Westinghouse believes that increasing gains in productivity will come from the indirect cost area.

Mr. Jernstedt says: "We place indirect labor under managed costs. In the past, when activity increased, these costs would rise. But as the volume decreased, these costs did not come down proportionately. One of the steps taken by many Westinghouse divisions was to establish a standard volume—the smallest forecast of annual volume expected during the next three years. All activities of an expense nature are geared to the standard volume level and are not affected by normal fluctuations of volume.

• **The control group is responsible for the control of inventories and for scheduling of the flow of materials.**

The control function improves production and control systems, reduces and consolidates paperwork into data processing centers.

• **A permanent manufacturing planning department is at work in every division.**

The planning organization provides the professional personnel to continually develop new and improved methods and facilities. "New plant planning probably best explains how the planning function operates. A parallel planning team is separated from an activity presently producing the product. This planning team does not concern itself with the day-to-day job of planning operations; it devotes full time to the job of planning the new plant. These planning teams are assigned three to four years in advance of the time we expect a major new plant to start operations. Where the planning team has been particularly aggressive and imaginative in establishing new methods in the new plant, we have secured improvements in productivity of 20 per cent," explains Mr. Jernstedt.

He believes: "It is not necessary to build a new plant to increase productivity. It is necessary to have a permanent organization devoting full time to initiating projects of scope to do an effective job."

Rep. Wilbur Mills credited for good timing as . . .

Tax Reform Plan Gets Push

CIRCUMSTANCES favor some form of tax relief next year.

First, you can see an indication of intent in the scheduling of hearings by the House Ways & Means Committee (it originates all tax legislation). Credit Rep. Wilbur Mills (D., Ark.), chairman of the committee, with a superb sense of timing. Hearings start Nov. 2, about a year to the day before we go to the polls in 1960. They will probably last until Congress reconvenes in January, 1960. Tax reform legislation could become the major campaign issue that spring.

Second, a slight surplus in the federal budget for fiscal 1960 (which opportunely ends June 30, 1960) could bloom into a substantial surplus as personal income and corporate profits rise. Nothing could be better calculated to give Congress the chance to cut taxes.

Third, the House passed only a one year extension of the 5 per cent (Korean) tax rate. You can assume that Representative Mills used his great influence to keep the extension down to one year. It was reported that some other Democratic leaders wanted a two year extension to avoid a corporate tax hassle in an election year.

Objectives of the Tax Hearings

The Ways & Means Committee has divided its hearings into four major areas: 1. A general appraisal of the tax system to select proper objectives of reform. 2. A study of the size and characteristics of individual and corporate tax bases. 3. Features of the system which have been installed for special reasons and which may now need to be re-evaluated. 4. An analysis of the income tax rate structure.

Business expense deductions will be looked at carefully, the committee promises. They include depreciation, depletion (and exploitation and development costs), research and development costs, and entertainment expenses. The tax treatment of retirement plans and stock options will also be investigated.

Here Is Metalworking's Opportunity

Chairman Mills emphasizes the hearings are the first phase of the committee's study: "The hearings are exploratory in character and are intended to determine the practical possibilities of establishing a broader income tax base and lower rates. No legislative program will be undertaken by the committee until interested persons have been afforded the opportunity to express their views."

The committee will attempt to work with as few preconceptions as possible. Panels of tax experts from all phases of the economy will participate, and it wants to hear what you want done about taxes.

As in the case of depreciation last year, Congress has opened the door, giving metalworkers an opportunity to get some constructive help. The lessons learned then still pertain: Industry probably failed to get depreciation reforms because it was apathetic and because it did not present a united front. It couldn't even agree on what it wanted (STEEL, Mar. 2, p. 69).

Renegotiation Appeals Stalled?

The House's four year extension of the Renegotiation Act contained a little help for metalworking. It provided for a U. S. Court of Appeals review of U. S. Tax Court decisions on renegotiation cases. But it looks as if the Senate will kill this feature. It did last year when the act was extended for one year. Thomas Coggeshall, Renegotiation Board chairman, withdrew his endorsement of the appeals amendment following testimony before the Senate Finance Committee. It was stated that the tax court is carrying too big a case load now. If cases could go on to the Court of Appeals, more cases would be filed with the tax court, said a spokesman for the tax court.

Charles Stewart, Machinery & Allied Products Institute, expressed the fears of all businessmen that the four year extension is a "long step" toward making renegotiation permanent.

'Lobby' Talk Must Be Watched

Metalworking, particularly defense contractors, must tread lightly in its attempts to gain tax reforms, warn Washington observers. Talk of a "munitions lobby" did much to kill renegotiation reform. When depreciation tax reform comes up for discussion in Congress next year, you can expect plenty of finger pointing.

中國鋼鉄工業

Shanghai's first blast furnace

Steel Boom in China: It's Ominous

ED CHINA is moving menacing- up the industrial ladder. Capital ods production is expected to ral 46 per cent this year. Output consumer goods is expected to rease 34 per cent. "Production several hundred million tons of el within ten years is not impos- le," says Hsueh Pao-ting, top nomic planner.

China's leaders admit the 1959 goal of 18 million tons of steel is far short of its needs for 600 million population.

But they claim last year's successes (see Page 102) prove they can advance rapidly. Po I-po, National Economic Commission head, looks at "objective possibilities": "Eighteen key iron and steel enterprises will increase capacity to about 16 million tons. Additions to present works and construction of 24 medium sized steel mills will add 6 million more tons. There are also many small steelmaking furnaces."

• Major weakness of China's mushrooming industry: It's big in the middle but small at both ends.

Smelting expanded spectacularly last year, outstripping steel rolling capacity and ore, coke, and refractory production. The Reds hope to

(*Please turn to Page* 102)

UNIVERSAL-CYCLOPS STEEL

. . . with a New Plant and New Cold Finishing Facilities at Coshocton, Ohio

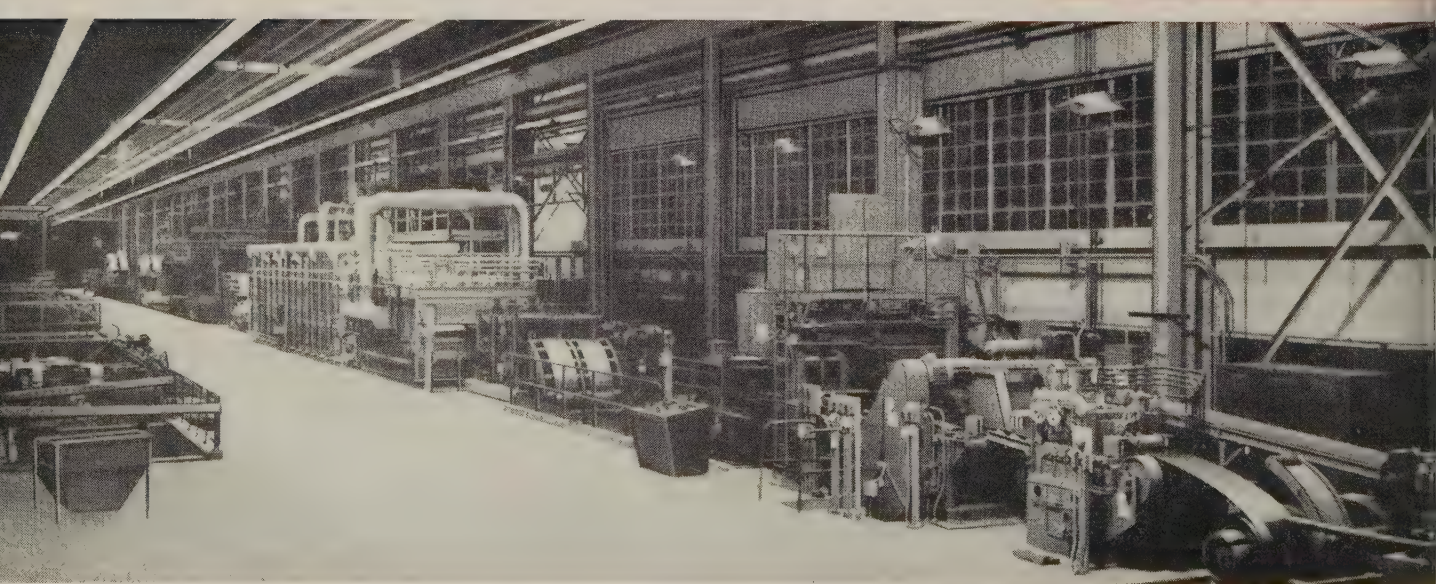
Universal-Cyclops, one of the leading producers of cold rolled stainless steel strip, announces the opening of a new plant at Coshocton, Ohio, which will supplement our facilities at Bridgeville, Pa., and greatly augment production capacity to meet the ever-increasing demands for UNILOY® Stainless Steel.

Completely new, this modern plant represents a major step in our corporate expansion program. It provides the finest facilities, production skills, engineering and metallurgical experience. It conforms to the policies maintained throughout our 75 year history, to constantly strive for highest quality standards in our products.

Customer oriented throughout, personnel and equipment are geared to meet the needs of our customers. Large stocks of finished coils are maintained at all times for prompt delivery.

UNIVERSAL CYCLOPS
UC STEEL
STEEL CORPORATION
Bridgeville, Pa.

STAINLESS STEELS
TOOL STEELS · HIGH TEMPERATURE METALS



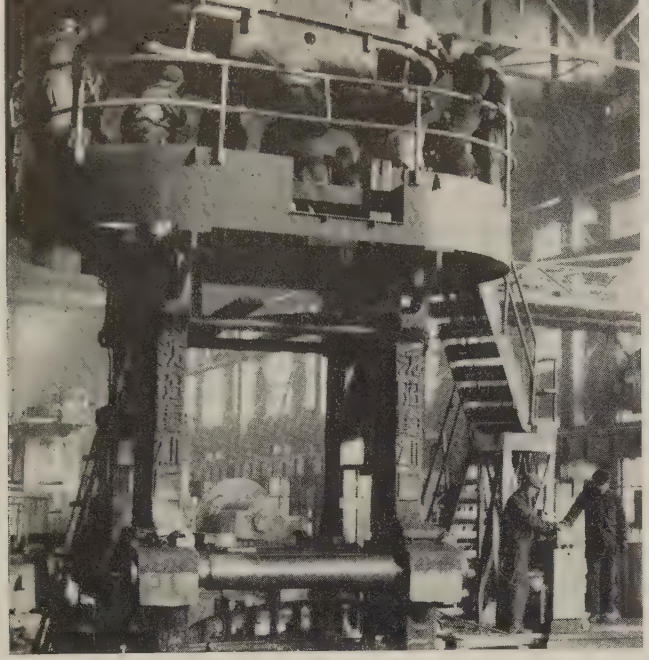
The most modern annealing and pickling line in the industry—over 600 ft. long. Handles two coils up to 24″ width.

Stainless Strip Capacity

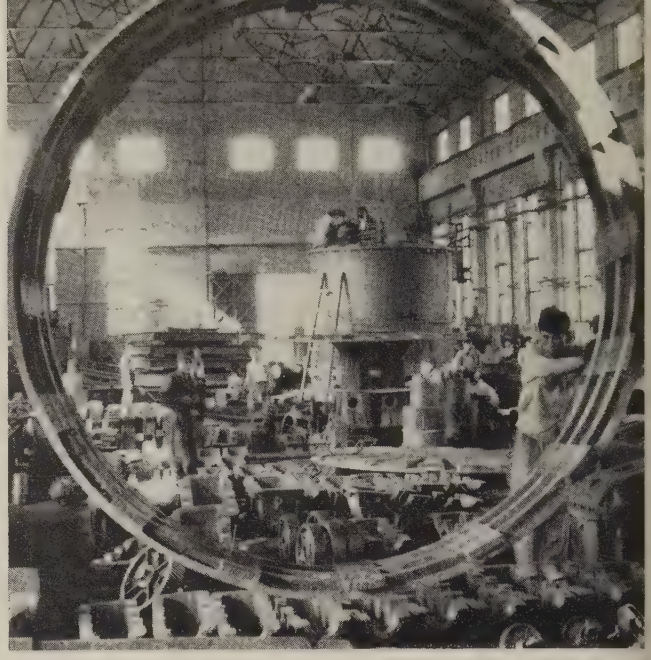
lern four-high cold rolling mill.

Temper mill provides top quality finish.

Large stocks of stainless steel coils—assure prompt delivery.



This blooming machine was produced at the Shenyang plant. Capacity: 800,000 to 1.2 million tons of blooms annually. It will be installed in a steel works in Tientsin



This is an assembly shop at the Shenyang mining equipment plant in northeast China where metallurgical mining machinery is made

STEEL BOOM IN CHINA . . .

correct this situation. Output of rolled steel is scheduled for a 50 per cent boost. Other priority projects include machine tools, power generating equipment, and vehicles.

The major ore and other raw material mines are expected to double production this year. Manganese, magnesium and silicon ore, dolomite, and fire clay output will climb steeply.

Existing batteries of ovens are not capable of doubling last year's coke production. The load will fall into hundreds of simplified batteries to be built this year. A 12 oven battery, designed at Anshan, will yield 10,000 tons of coke annually. Construction time: One month. Semimechanized, it can recover coal gas, tar oil, nitrogen, and benzol. Dairen, which produces most of the modern batteries, is to turn out 45 sets with an aggregate annual capacity of 500,000 tons.

About 600 sets of simplified equipment will reportedly yield 3 million tons of firebrick.

• Tens of thousands of small iron smelting furnaces are being modernized and many tiny blast furnaces and converters are under construction.

The blast furnaces are built in 10 to 14 days. Size: 10.4 to 36.4 cubic yards. Daily capacity: 8 to 35 tons. The shell is brick lined with heat resistant materials. Galvanized sheets are used for the hearth. These furnaces have upped pig iron production in Anhwei province, where iron and coal deposits are rich, from virtually nothing to over 1 million tons annually within six years. The Chinese now claim blast furnaces total over 78,000 cubic yards in volume.

• Of the many small iron and steel furnaces put in operation last year, inefficient operations have been eliminated, the Reds claim.

Others have been grouped into integrated systems with rolling mills and other equipment. The small furnaces account for half of the country's pig iron output.

A center being built at Tunghwa consists of five iron and steel complexes with 5000 small iron smelting furnaces and about 100 small blast furnaces. Each complex has an iron works with a 16.9 to 331.5 cubic yard blast furnace, a steel plant with 12 to 60 ton converters, open hearths, rolling mills, and coke plants. The largest facility will have

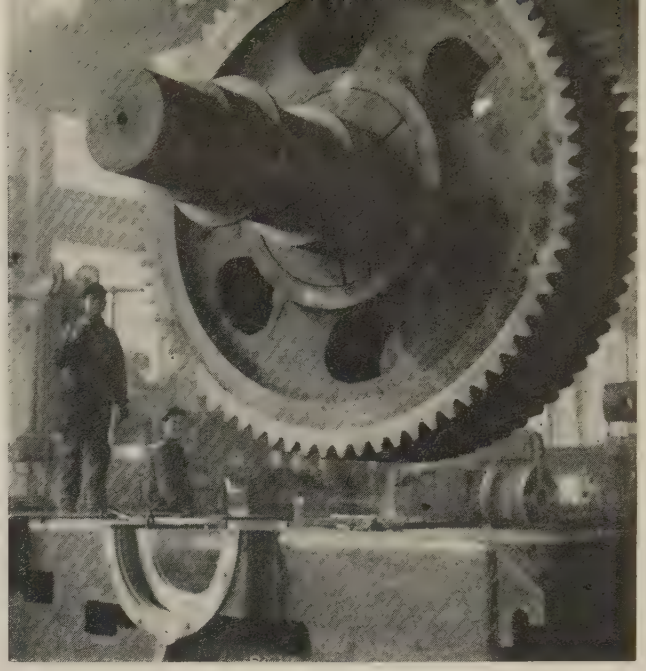
Industrial Growth Is Rapid

(Production rates)

	1959*	1958	1957
Steel	18 million tons	11.1 million tons	5.4 million tons
Pig Iron	23 million tons	13.7 million tons	5.9 million tons
Coal	380 million tons	270 million tons	135 million tons
Electric Power	40 billion kw	27.5 billion kw	13.8 billion kw
Machine Tools (Metal Cutting)	75 thousand units	50 thousand units	10 thousand units

*Communist target.

Big gears for ball mill machines are made at Shenyang. China's machine building industry is emphasizing rolling mill, power generating, coal washing, coke oven, mining, and irrigation equipment, and locomotives



The first Chinese steel sheet rolling mill was made at Taiyuan. The roller measures 29.9 in. in diameter and can turn out 30,000 to 50,000 tons of 47.2 in. wide plates. Workers are putting a gear in place

hese capacities: Pig iron, 800,000 ons; steel, 1 million tons; rolled teel, 800,000 tons; seamless steel ubes, 50,000 tons; coke, 1.8 million ons.

• Construction at Anshan, China's eading steel center, will include iew iron mining projects and facilties for ore dressing and coke production.

A 1,966.9 cubic yard blast furiace was built at Anshan last year n four months and four days. It ook three months and 21 days to uild a 600 ton capacity open iearth.

The nation's second biggest iron nd steel works, Wuhan, started proiuction last year and is scheduled o manufacture steel and rolled roducts this year.

Paotow, Inner Mongolia, will iake its first iron, steel, and steel roducts in 1959. The first coke ven went into operation in Febuary.

In 1958, Shanghai's steel output ncreased from 500,000 to 1.22 milon tons. The 1959 target: 1.6 iillion. The city's first blast furace, a medium plate rolling mill, nd a seamless tube mill (annual apacity: 50,000 tons) began proiuction early this year. Another last furnace and seamless tube mill re under construction.

• Reports indicate the Chinese are making rapid technical advances.

The average iron output of large blast furnaces per cubic yard of available volume per 24 hours reached 1.15 tons. Average 24-hour production by open hearths per square yard of furnace floor reached 6.48 tons. China's highest capacity open hearth at Anshan made a record fast heat in 10 hours 25 minutes compared with the scheduled 15 hours.

• Marked success has been reported in desulfurizing pig iron yielded by local blast furnaces.

In some areas, it is claimed, more than 80 per cent of such pig iron can be made into good steel. With the aid of an East German expert, the Tayeh steel plant, near Wuhan, has made carbon steel containing only 0.024 per cent sulfur from local pig iron and scrap. Steel from the open hearth was mixed with molten steel from an electric furnace containing 5 per cent basic slag. Steel of 0.057 per cent sulfur was produced from the open hearth furnace. When mixed with steel containing basic slag, the sulfur content of the mixture dropped to 0.024 per cent.

New products last year included many kinds of low alloy, high tensile structural steel, clad stainless sheet steel, 22 in. high I beams, and steel plates about 5 in. thick. Highlights of steelmaking equipment were the 1966.9 cubic yard blast furnace, a medium plate rolling mill which makes plates up to 91 in. wide, and a 2500 ton hydraulic press capable of forging 48 ton steel ingots. Early this year, the Taiyuan plant made a sheet rolling mill with a diameter of 30 in. and weighing 380 tons.

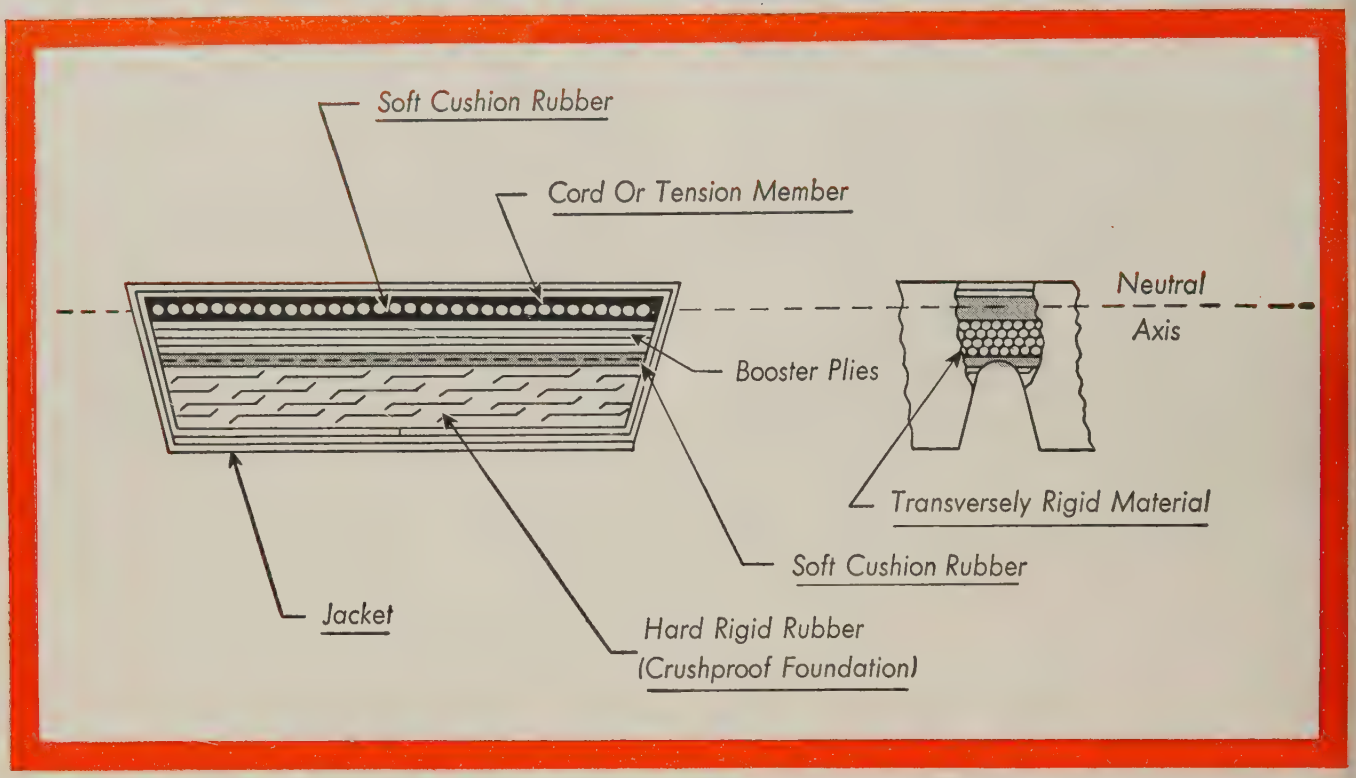
• The machine building industry claims it can produce heavy and high precision machines meeting the highest world standards.

An electronically controlled vertical lathe, a program controlled milling machine, precision lathe and gear grinding machines, a 16.4 ft hobbing machine, and a 45.9 ft double housing planer were among the major achievements. A Shanghai plant turned out a 14.8 ft vertical lathe this year. Previous size champ: 11.1 ft.

The training of technical personnel in China is forging ahead. Over 30,000 skilled workers have been trained in the last two years.

This article is based on information gathered by Robert Westgate, Auckland, New Zealand.

US RUBBER ROYAL VARIABLE SPEED BELT



HERE'S WHY THIS VARIABLE BELT IS NON-SQUASH, NON-SAG

No excuse for any more variable speed belt problems. The U. S. Royal Variable Speed Belt will lick any production problem—where other belts try and fail.

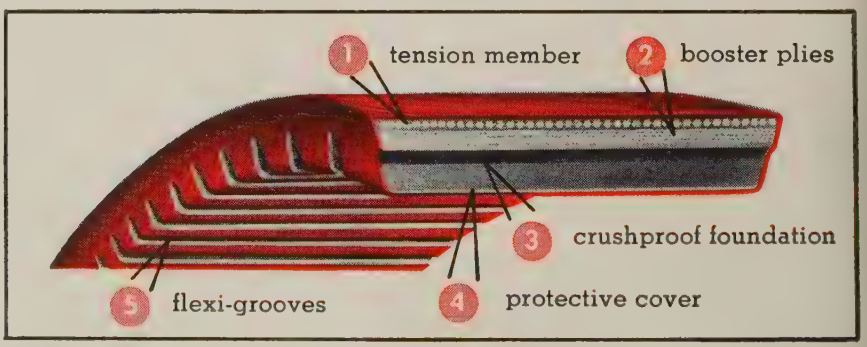
Note in the diagram the use of hard rigid rubber—the soft cushioning rubber in which cords or tension members are imbedded—the special jacket (oil and heat resistant).

The exclusive and complete crosswise rigidity in U. S. Royal prevents squashing. Lengthwise stretch is just about zero, by every test. *No sagging.*

U. S. Royal has complete accuracy regardless of speed changes—whether you switch from 2000 rpm to 10. It has scored a complete success in every textile mill, pulp and paper mill, chemical plant and metal working plant in which it has been installed.

• • •

Your nearest "U.S." Power Transmission Distributor will be glad to demonstrate the U. S. Royal on your own drives, at your own plant. You'll save a great deal in replacement costs and down goes downtime.



US RUBBER

Mechanical Goods Division

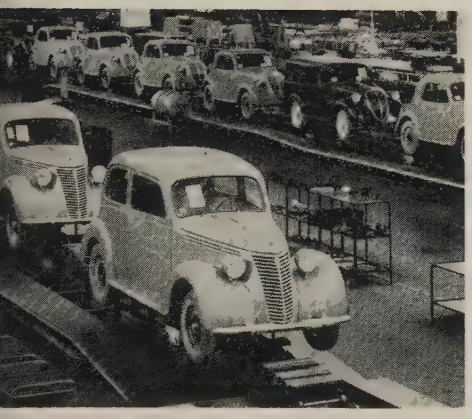
United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

SAE Looks at Foreign Competition

Society of Automotive Engineers goes into session at Atlantic City, N. J., this week. Highlights of the meeting show what auto engineers are considering for future cars



WHICH SMALL CAR FOR YOU?

DRIVERS enjoy small cars, but larger automobiles will always have a host of friends: The passengers. That comment comes from Laurence Crooks, chief of Consumers Union's automotive division. Mr. Crooks says European drivers are more critical of a car's behavior. They don't want pushbuttons and power gadgets. Americans prefer comfort. Both like economy. Detroit's small cars are going the "economy-comfort" route instead of following the European philosophy.

This approach re-emphasizes Motordom's belief that Volkswagen and Renault will be able to hold their own in the economy car market, but cars like Opel, Volvo, and Peugot, which compete pricewise against Falcon, Convair, and Valiant, will have tough sledding.

Europe's Car Production

(In millions)

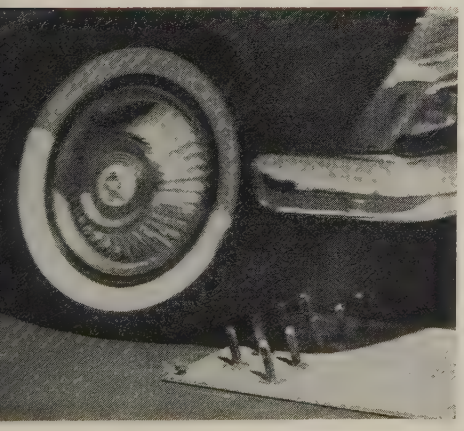
1959*	4.1
1958	3.6
1957	2.9
1956	2.5
1955	2.4

*Projected. Includes France, England, Germany, Italy.

COMMON MARKET NEEDS U. S. CAPITAL

EUROPE'S six Common Market countries contain 168 million people who potentially should buy 5.5 million to 6 million cars annually, one marketing researcher tells STEEL. Andre Laurent, secretary-general of Belgium's SAE, says 95 per cent of these vehicles will be in the 500 cubic centimeter to 2.2 liter (30.5 to 122 cu in.) class. He reports the 32 per cent tariff barrier means U. S. producers can profit in this market only through capital investments and subsidiary operations (see STEEL, June 8, p. 74). Holland and Belgium are likeliest countries.

Example: Foreign plants of the U. S. Big Three carbuilders account for 20 per cent of car and 14 per cent of truck production in Italy, France, Germany, Luxembourg, Belgium, and Holland.



SPARE TIRES HAVE TO GO

LESS THAN HALF of the U. S. cars built in 1965 will have spare tires, predicts a car division vice president. Automakers need the extra trunk space, particularly in the smaller cars, he says. Despite the move, total wheel volume is expected to increase because more cars will be built.

R. E. Davies, B. F. Goodrich Co., and H. B. Hindin, U. S. Rubber Co., say that if the spare is eliminated, it will be necessary to provide tires that can travel 200 miles if punctured so they don't have to be dismounted on the road.

Under consideration are free flowing sealant particles within the tire, dual chambers, and auxiliary inner tubes that can be inflated with compressed air. Collapsible spare tires probably won't be used because they still take up trunk space.

Small Car Specifications*

	Ford's Falcon	Chevrolet's Corvair	Chrysler's Valiant
Wheelbase	109.5 in.	108 in.	106 in.
Length	181.1	180.5	183.8
Width	70	69.5	70.1
Height	54.5	52	54.1
Weight	2350 lb	2180 lb	2600 lb
Engine Type	OHV in-line 6 cylinder	Opposed 6 (aluminum)	in-line 6
Displacement	144 cu in.	121 cu in.	170 cu in.
Horsepower	86.5	92	120

*Anticipated.

George Walker Predicts

George Walker, Ford Motor Co.'s styling vice president, predicts the next 50 years will bring these five developments in auto design:

1. Roofs made of glass with the structural strength of steel. Molecular structure of the glass will change with the angle of light to form a natural shade.

2. Smaller engines, some using chemical fuels similar to today's rocket engines.

3. Changes in basic proportions of cars to provide larger seating area without increasing over-all lengths and widths. This may be partly accomplished through unitized construction.

4. Greater simplicity of styling to get crisp, functional appearance.

5. Cars that move through the air similar to Ford's Levacar Mach 1 (see STEEL, June 8, p. 77). To get an idea of what such a car could look like, you'll want to enter STEEL's Beat-the-Experts Contest. Copies of a dream car rendering by Mr. Walker will be presented to the runners-up (see Page 5).

Dodge Darts for 1960

Pioneer, Mohican, and Seneca are the series names of Dodge Div.'s new Dart line of cars to appear in September. Built on Plymouth's 118 in. wheelbase, the Dart is smaller than the regular Dodge and offers a full model range of hardtops, convertibles, and station wagons. It features semi-unitized body construction. Reported height: 52.2 in.

Styling will differ from Chrysler's 1960 regular finned lines. The Dart has crisper sheet metal, no fins. Power: Plymouth's revamped six cylinder engine. Optional: An eight cylinder powerplant. Two Dodge series are to replace the old three. Dart will be the lower priced series.

Although the compact car will compete with Plymouth, it is larger than Chrysler's small car, Valiant (not expected before early 1960). Dodge and imported Simca cars are to be marketed jointly. So will Plymouth, De Soto, and Valiant, say Chrysler sources. Chrysler and Imperial models will continue as duals. Some of these dealers will get Simcas too.

Exhaust Notes

• Under its planned diversification program, Studebaker-Packard Corp. has purchased Gering Products Inc., Kenilworth, N. J., a producer of plastic compounds, polyethylene film, and plastic garden and industrial hose.

• Five month production for Ford is 788,067 cars and 145,440 trucks. Last year, the company built 508,915 cars and 98,358 trucks in five months. Chrysler Corp. reports 356,388 cars and 36,383 trucks vs 259,953 cars and 24,625 trucks a year ago. General Motors' production for the same periods totals 1.32 million cars and 212,191 trucks against 1.04 million cars and 152,473 trucks.

• Lee Desmond, Dodge Div. assistant general manager, says Dodge buyers are getting away from colors. He claims white is the No. 1 choice. Black ranks second in the Midwest and East. Light colors are still preferred in the West.

• A French truck builder has introduced a diesel engine that will deliver 20 per cent more horsepower than conventional diesels and runs on such inexpensive fuels as unrefined crude oil.

• The government has ordered $13 million worth of Ford pickup and 1½ ton platform trucks to be delivered over the next six months. About half of the vehicles will be assembled at Ford Div.'s Norfolk, Va., facilities.

• Ford has selected Kenosha, Wis., as a new port of entry for English Ford and German Taunus automobiles.

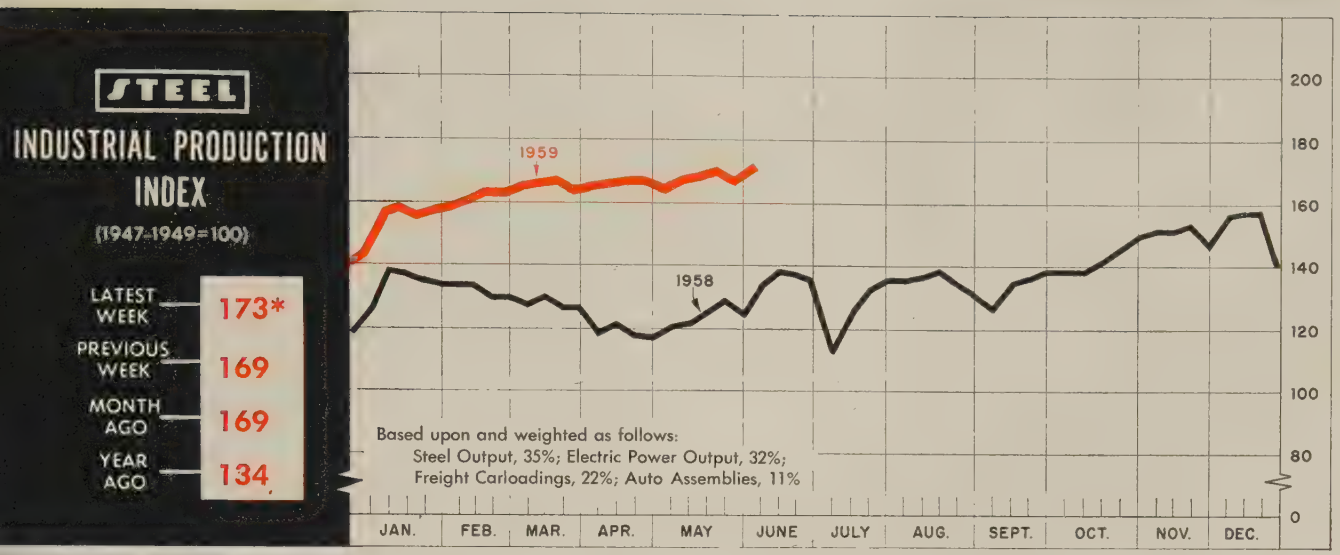
U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,817	349,613
5 Mo. Totals	2,725,968	1,904,902
June	.....	337,446
July	.....	321,017
August	.....	180,447
September	.....	130,460
October	.....	261,701
November	.....	514,152
December	.....	593,920
Total	.....	4,244,045

Week Ended	1959	1958
May 9	134,763	78,506
May 16	135,856	87,407
May 23	133,568	86,082
May 30	117,372	66,844
June 6	126,298†	73,696
June 13	132,000*	78,163

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.



*Week ended June 6.

Index Sets Fourth Record in Month

THE ECONOMY has reached a new high. After taking little more than a breather over the Memorial Day weekend, all hands turned to and pushed STEEL's industrial production index (preliminary) to a record 173 (1947-49=100).

It's the fourth week in the last five in which a record has been tied or broken. If the current trends among the components persist, the newest record will last only a week. When this string started in early May, the index read 169. The prerecession high was 168.

Summer Is Coming—The principal factor in this latest show of strength is the electricity industry. Output of electrical energy is running about 14 per cent ahead of the year-ago figures, pushing the weekly figure above 13 billion kw-hr during the week ended June 6. It's the first time that level has been reached since the last full week in 1958. The upturn is seasonal, reflecting greater industrial activity and warmer weather.

The other three factors of the index are holding steady at high levels. Steel production has varied only slightly (less than 2 per cent) since the second week in March. With the exception of the weeks ended May 30 and June 6 (both of which were affected by holiday shutdowns) auto and truck production has been steady at about 160,000 units a week. While freight carloadings have been fairly steady at about 685,000 to 690,000 cars for the last four weeks, they showed a normal seasonal upturn prior to that time.

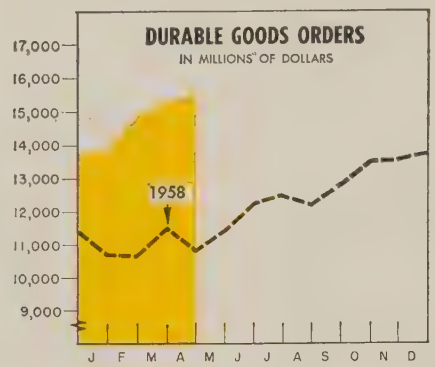
What's in Store—But the era of weekly records is almost ended. The steel industry, which holds the key, is trying again to break the jinx that has prevented it from establishing another production record. During the week ended June 14, producers scheduled output of about 2,665,000 net tons for ingots and castings. It would top the peak

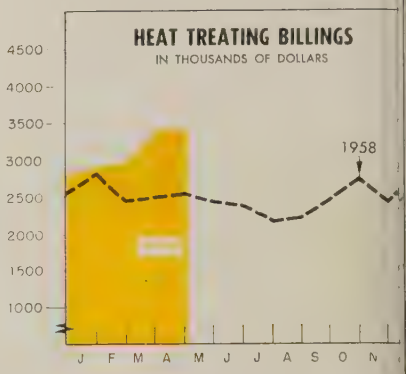
BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,681[1]	2,653	1,728
Electric Power Distributed (million kw-hr)	13,100[1]	12,761	11,681
Bituminous Coal Output (1,000 tons)	8,155[1]	8,355	7,189
Crude Oil Production (daily avg—1,000 bbl)	7,200[1]	7,203	6,256
Construction Volume (*ENR*—millions)	$315.7	$679.1	$481.4
Auto, Truck Output, U. S., Canada (*Ward's*)	163,729[1]	153,678	97,877
TRADE			
Freight Carloadings (1,000 Cars)	690[1]	688	613
Business Failures (Dun & Bradstreet)	264	259	278
Currency in Circulation (millions)[3]	$31,641	$31,473	$30,989
Dept. Store Sales (changes from year ago)[3]	+5%	+9%	−1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$24,135	$23,614	$20,547
Federal Gross Debt (billions)	$286.4	$285.8	$275.7
Bond Volume, NYSE (millions)	$27.6	$26.4	$29.7
Stocks Sales, NYSE (thousands of shares)	14,786	14,873	13,530
Loans and Investments (billions)[4]	$94.6	$94.9	$92.1
U. S. Govt. Obligations Held (billions)[4]	$28.7	$29.0	$31.1
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	222.2	222.0	194.2
All Commodities[7]	119.5	119.5	119.1
Commodities Other than Farm & Foods[7]	127.8	127.8	125.2

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

THE BUSINESS TREND





	New Orders* 1959	New Orders* 1958	Sales* 1959	Sales* 1958
Jan.	13,900	10,704	13,541	12,646
Feb.	14,918	10,688	13,870	12,038
Mar.	15,300†	11,488	14,400†	11,670
Apr.	15,600†	10,833	15,100†	11,532
May	.....	11,423	.....	11,643
June	.....	12,245	.....	12,086
July	.....	12,512	.....	12,256
Aug.	.....	12,177	.....	12,385
Sept.	.....	12,859	.....	12,723
Oct.	.....	13,530	.....	12,943
Nov.	.....	13,574	.....	13,295
Dec.	.....	13,673	.....	13,613

*Seasonally adjusted. †Preliminary.
U. S. Office of Business Economics.

	1959	1958	195
Jan.	2,915.5	2,825.5	3,53
Feb.	2,976.0	2,466.3	3,37
Mar.	3,397.3	2,490.5	3,63
Apr.	3,420.6	2,538.0	3,57
May	.....	2,421.5	3,38
June	.....	2,374.8	2,91
July	.....	2,139.6	2,76
Aug.	.....	2,213.0	2,83
Sept.	.....	2,457.1	2,76
Oct.	.....	2,744.9	3,07
Nov.	.....	2,422.0	2,67
Dec.	.....	2,799.4	2,57

Metal Treating Institute.

reached in mid-April, but it must be pointed out that operating schedules have fallen short every week since then.

If steelmakers don't make it this week, their chances for a record are gone until sometime in the fourth quarter. Unless a contract settlement is in sight by the middle of this week, they will be forced to start cutting operations to be ready for a strike on July 1. Even if a settlement seems certain, operations will be cut back to a more normal summer level.

Recovery Base Is National

The basis for this spring upturn has been broad. As the First National City Bank of New York puts it: "The advance is being felt throughout the economy—in manufacturing, trade, and services." To this might be added: "In every section of the nation." Hopscotching around the country, here is what you will find:

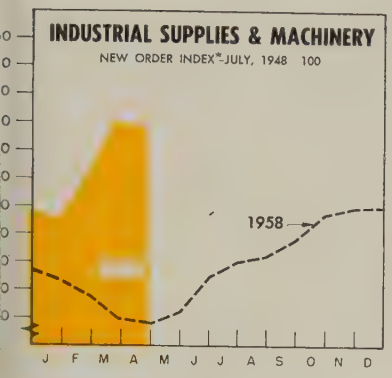
In Southern California, the business activity index of the Los Angeles Security First National Bank has risen for 13 consecutive months, the last seven of which have produced record levels.

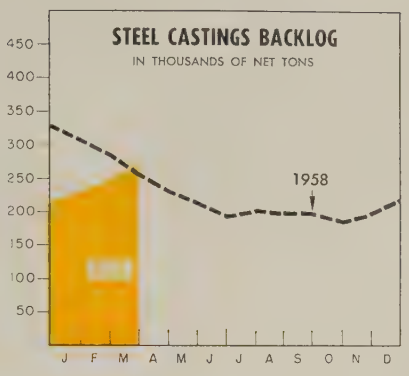
In the Third Federal Reserve District, manufacturing output is running better than 12 per cent ahead of the year ago pace, say Fed officials at Philadelphia. Employment statistics, which had been lagging the national scene, are showing signs of improving.

Business activity in the Pittsburgh area is being spurred by heavy steel production, but other areas of business are responding about as well. The weekly index of the Bureau of Business Research at the University of Pittsburgh is holding slightly below the all-time high of late 1956. In the most recent period, industrial production and originating freight shipments reached new 1959 highs.

In the Tenth Federal Reserve District, better business is reflected by a significant increase in bank loans. Officials at the district's headquarters in Kansas City, Mo., say that loans in the first quarter were $43 million above what they were in 1958's period, with business loans accounting for $19 million, more than any other category. Department store sales for the district are up 11 per cent to date, which is considerably better than the national increase of 8 per cent.

Nonagricultural employment in





	1959	1958	1957	1956
Jan.	186	163	221	190
Feb.	202	157	219	190
Mar.	221	149	210	190
Apr.	218	148	203	195
May	...	152	199	199
June	...	164	199	197
July	...	170	197	203
Aug.	...	172	197	211
Sept.	...	178	203	203
Oct.	...	187	192	206
Nov.	...	189	180	220
Dec.	...	190	167	218

*Seasonally adjusted.
Amer. Supply & Machinery Mfrs.' Assn.

	Shipments		Unfilled Orders*	
	1959	1958	1959	1958
Jan.	105.4	120.7	232.6	304.9
Feb.	110.3	103.3	245.1	282.4
Mar.	131.3	106.2	270.7	252.8
Apr.	....	91 5	....	229.5
May	....	87.0	....	211.3
June	....	92.9	....	190.8
July	....	68.8	....	200.3
Aug.	....	80.9	....	196.3
Sept.	....	85.3	....	196.5
Oct.	....	95.4	....	184.9
Nov.	....	85.3	....	194.0
Dec.	....	103.8	....	214.4
Total	....	1,121.1		

*For sale. U. S. Bureau of the Census.

Arizona was at a peak in the latest reporting period, says the Valley National Bank of Phoenix. The biggest gains have been marked up by contract construction and manufacturing. The bank's business index stands at 205.9 per cent of the 1947-49 base (seasonally adjusted), which is fractionally below the record established earlier in the year.

Manufacturing and construction industries are leading the uptrend in employment in Utah, reports the University of Utah's Bureau of Economic & Business Research. Even though the state lagged the national employment figures, the number of nonagricultural jobholders in April set a high mark for that month. Steel output in the state (Columbia-Geneva Steel Div. of U. S. Steel) is at an all-time high.

From New England comes word that capital goods spending is picking up. The Boston Federal Reserve Bank has found that manufacturers plan a 2 per cent increase over 1958's expenditures. Last fall, the same executives indicated a 14 per cent cutback from the 1958 level. The New England area is also seeing a pickup in nonferrous metals, one of its more important industries. And shipbuilding is holding up well. One of the most outstanding comebacks is being staged by nonelectrical machinery, with machine tools and textile machinery leading the way.

A word of caution is voiced by the First National Bank of Boston: "While business and consumers alike are generally optimistic about the outlook, and rightly so, it should be recognized that we are clearly at a level of activity where we become increasingly vulnerable to a testing period."

Trends Fore and Aft

• Truckmakers are heading for a 1-million-unit-or-better year. John C. Virden, chairman and president of Eaton Mfg. Co., Cleveland, declares that the two main forces behind the surge are the road building program and the growing trend toward over-the-road freight traffic.

• Intercity truck tonnage in the week ended May 30 was 29.8 per cent ahead of what it was in the corresponding week of 1958, says the American Trucking Associations Inc. Railroad freight carloadings were also 29.8 per cent ahead of the year ago figure during the same week, says the Association of American Railroads.

Helixform*—a new method for bevel gear production!

The new No. 112 Hypoid Helixform Gear Finisher assures improved quality and increased production on spiral bevel and hypoid non-generated ring gears up to 10½″ in diameter, and 2½ DP such as employed in passenger car axles.

The Helixform Cutting Method used on this machine offers these advantages:

Conjugate tooth surfaces, minimized gear development, complete control of tooth bearing, and greater adjustability in final assembly.

We will be glad to send a bulletin giving further details on request. Ask for literature on the No. 112 Hypoid Helixform Gear Finisher and the companion No. 112 Hypoid Gear Rougher. Write for it today.

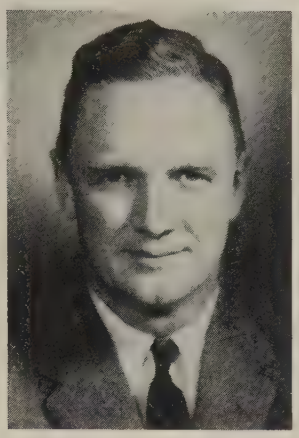
*Trade-Mark

GLEASON WORKS

1000 UNIVERSITY AVE., ROCHESTER 3, N.Y.

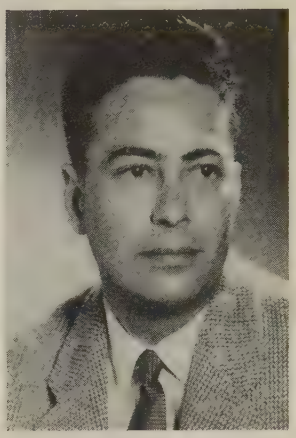
69-A

H. M. PATTON
American Hoist works mgr.



JAMES W. COULTRAP
MGD executive v. p.

DONALD J. NEARY
Bridgeport Thermostat post



ROBERT F. SHANNON
Detroit Sintered Metals post

H. M. Patton fills the new post of works manager, **American Hoist & Derrick Co.**, St. Paul. He continues as president of Valley Iron Works, acquired by American Hoist in 1958.

James W. Coultrap was promoted to executive vice president of **Miehle-Goss-Dexter Inc.**, Chicago, and its Miehle Co. Div. He was secretary and vice president of Miehle Co., and secretary of the parent corporation.

Robert L. Strawbridge, former group vice president, **Houdaille Industries Inc.**, Buffalo, was promoted to vice president - manufacturing. **G. C. Saltarelli**, senior vice president, assumes additional executive responsibilities which brings him in direct working relationship with the chairman, plus executive supervision over both the Manufacturing Div. and Construction Materials Div.

William R. Kennedy was made sales manager, **Hammel-Dahl Div.**, Warwick, R. I., General Controls Co.

A. B. Carlson was elected vice president-engineering, **H. D. Conkey & Co.**, Mendota, Ill. He was chief engineer.

Howard R. Hammond was made general manager of the newly created Defense Products Div., **Allis-Chalmers Mfg. Co.**, Milwaukee.

D. F. McCarron was named vice president-sales, **Globe Hoist Co.**, Philadelphia. He was president of Loyd Scruggs Co., St. Louis.

Donald J. Neary was named production manager, **Bridgeport Thermostat Div.**, Milford, Conn., Robertshaw-Fulton Controls Co. He was assistant production manager.

John B. Darrah was made vice president-general manager, Defense Div., **Budd Co.**, Philadelphia. For the last five years, Mr. Darrah has been assistant works manager in charge of dies, jigs and fixtures, and has also participated with atomics engineers in design and development for the aircraft nuclear propulsion program.

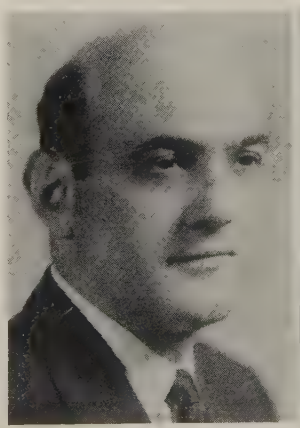
Daniel A. Porco was appointed to the new post of assistant to the president of **Crucible Steel Co. of America**, Pittsburgh. He was manager of the corporate development section. **Robert B. Hewett**, chief industrial engineer, was named to succeed Mr. Porco. **George I. Ziders**, works industrial engineer, Sanderson-Halcomb plant, Syracuse, N. Y., replaces Mr. Hewett.

Robert F. Shannon was made general manager, **Detroit Sintered Metals Corp.**, Kalamazoo, Mich., subsidiary, Bunting Brass & Bronze Co. He succeeds **Henry F. Latva**, who transferred to the Toledo, Ohio, office on special assignment. Mr. Shannon for the last ten years has been with P. R. Mallory Co., most recently in charge of manufacturing at its Mallory-Sharon Metals Div., Huntsville, Ala.

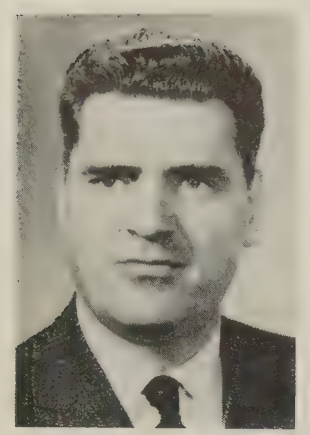
Edmond T. Duffy was named executive assistant to the vice president and director of sales, **Electric Auto-Lite Co.**, Toledo, Ohio. For the last ten years, he has been with Weatherhead Co. in sales management posts.

J. F. Miller was made sales manager, secondary sheet products, at **Weirton Steel Co.**, Weirton, W. Va., division of National Steel Corp.

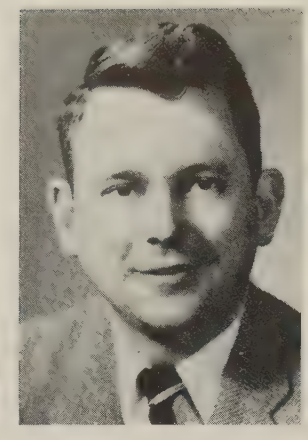
Pfaudler Permutit Inc., Rochester, N. Y., appointed Vice President



DANIEL A. PORCO ROBERT B. HEWETT GEORGE I. ZIDERS
management posts at Crucible Steel Co. of America

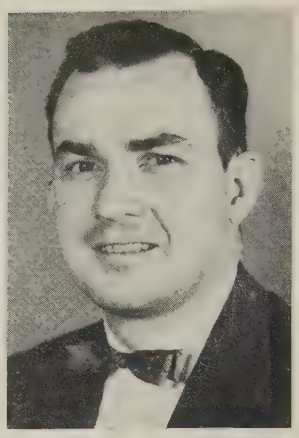


JERRY CAPRIO



JOHN STEINEBACH

A. P. Smith promotions



GEORGE A. FORT

ROBERT CAMPBELL

Gary Steel Wks. appointments

George C. Calvert to direct its newly created International Div.

Jerry Caprio was promoted to manager of engineering, **A. P. Smith Co.**, East Orange, N. J. **John Steinebach** was promoted to assistant plant superintendent.

C. C. Helmle was appointed vice president-general manager, **Enthone Inc.**, New Haven, Conn., a subsidiary of American Smelting & Refining Co. He continues as sales manager.

Four district sales managers named by **Republic Steel Corp.** are: **Charles W. Kennedy**, Houston; **Henry A. Bourne**, Tulsa, Okla.; **L. Fred Renneckar**, San Francisco; **L. Alex Wigley**, Seattle.

M. J. Steffes, vice president, **Super Tool Co.**, division of Van Norman Industries, Detroit, was elected executive vice president. He has been vice president-sales and director of research.

At the Gary, Ind., Works of **U. S. Steel Corp.**, **George A. Fort** was named assistant to the general superintendent-cost improvement. He is replaced as superintendent, Coke & Coal Chemicals Div., by **Robert Campbell**, who was assistant division superintendent-coke and coal chemicals, Clairton, Pa., Works.

John C. Cassidy was appointed Chicago district sales manager, **Page Steel & Wire Div.**, American Chain & Cable Co. Inc.

Kenneth O. Parker was made chief engineer, **United Aircraft Products Inc.**, Dayton, Ohio. He was assistant chief engineer. **Frank A. Ryan** was made vice president-sales; **Frank J. Coykendall**, treasurer.

Edward O. Falberg was appointed division manufacturing manager, **Bohn Aluminum & Brass Corp.**, Detroit, responsible for manufacturing operations of two of Bohn's plants at Greensburg, Ind., and at Holland, Mich. **Carl F. Brown** succeeds Mr. Falberg as plant manager at Greensburg.

Wilfred H. Best transfers from General Motors Corp.'s Chevrolet Div. in Detroit to the **Frigidaire Div.**, Dayton, Ohio, as manager of material and production control. **I. C. Hartzell**, former manager-material control and purchasing for Frigidaire, has retired. **Joel T. Heavin**, director of purchases under Mr. Hartzell, becomes purchasing agent, reporting to the general manager.

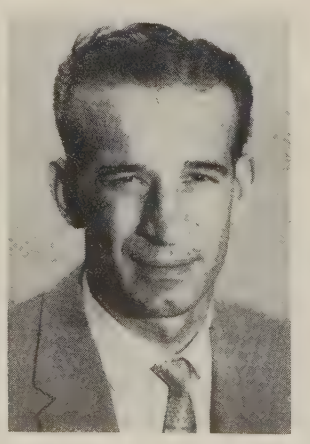
William N. Hoelzel, **C. R. Anderson**, and **John P. Quinlan** were named assistant vice presidents-sales of the Gary, Ind., Div., **Screw & Bolt Corp. of America.**

James M. Kimbrough Jr. was made sales manager, Sheet & Strip Div., **Republic Steel Corp.**, Cleveland.

Edward I. Renouard was elected vice president-western operations, **Anaconda Co.**, New York. Manager of mines, Butte, Mont., since

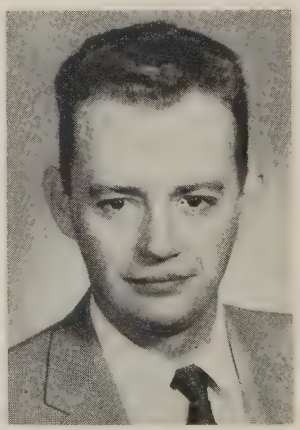
M. J. STEFFES

Super Tool exec. v. p.



KENNETH O. PARKER

United Aircraft chief eng.



EDWARD O. FALBERG

Bohn Aluminum div. mfg. mgr.

EDWARD I. RENOUARD

Anaconda v. p.-western

ON THE BALL
500,000
TIMES A DAY
BRIDGEPORT
Free-Machining
Brass Rod!

Because ball point pens are in everyday use, production of vital brass tips becomes astronomical along with quality control problems.

These tips — one of which is shown much enlarged — are produced at ultra-high speeds. The brass rod needed for them must be flawless in every respect. *Consistent* metallurgical composition, *precise* dimensional tolerances and *unvarying* standards of machinability — if any of these qualities vary even a fraction, production comes to a frequent and costly halt.

That's why Revere Metal Art Co., Inc., New York City, specifies Bridgeport Free-Machining Ball Point Pen Brass Rod for these inserts. It meets all requirements for precision, straightness, workability, machinability and tolerances —and, in addition, provides a surface finish that keeps finishing time and costs to a minimum.

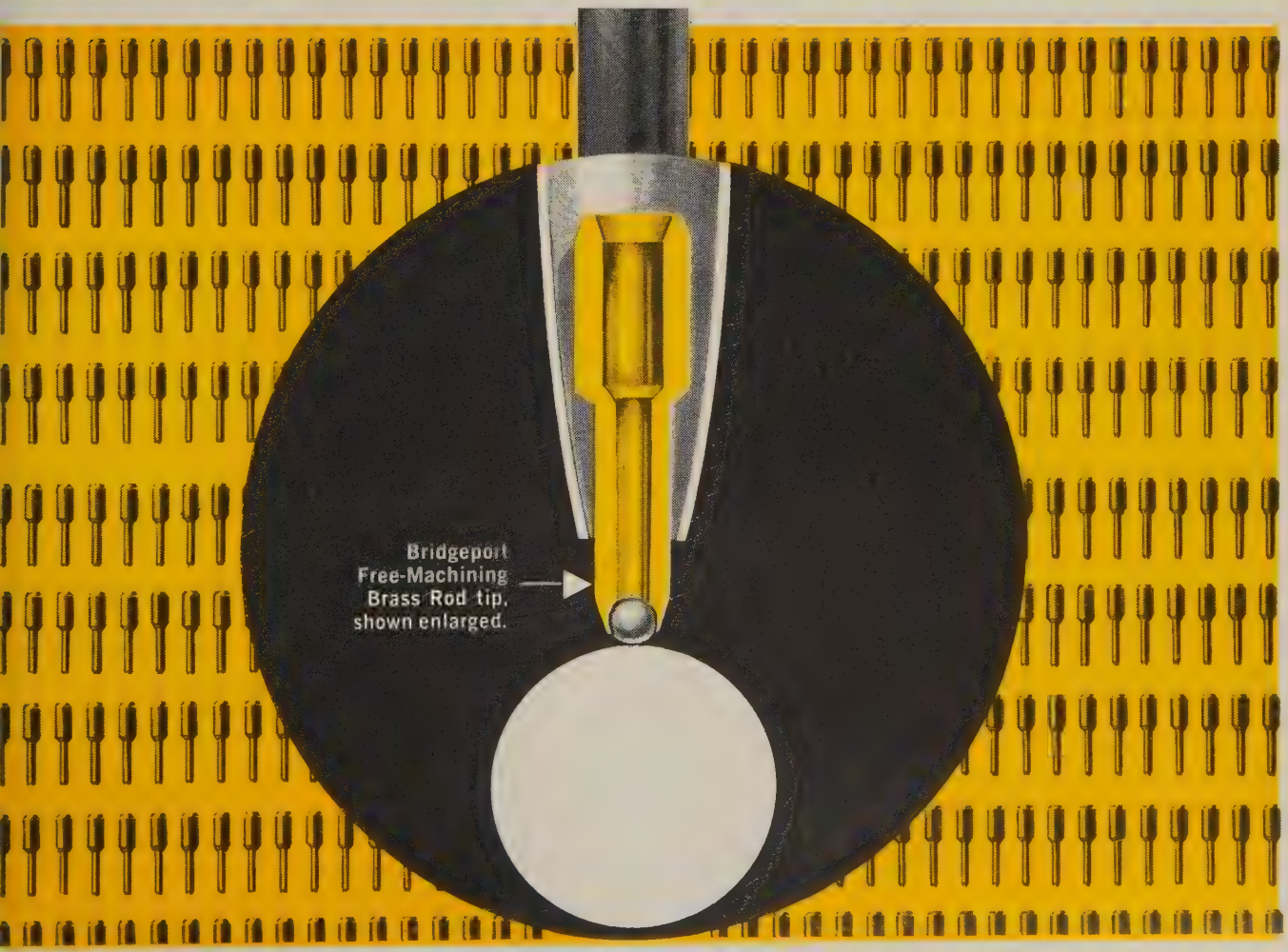
Whether you use rod, strip or tube, you can count—just as Revere does—on getting consistent quality every time you specify Bridgeport Brass Alloys. It will pay you to get the complete story. Call your nearest Bridgeport Sales Office or write us direct for a complete list of Bridgeport products—Dept. 3907.

BRASS Bridgeport CO.

BRIDGEPORT BRASS COMPANY

BRIDGEPORT 2, CONNECTICUT

Specialists in Metals from **A***luminum to* **Z***irconium*



THOMAS O. ENGLISH
Alcoa gen. purchasing agent

EDWARD F. SCHWEICH
Lewin-Mathes president

NORMAN W. TUCKER
Youngstown Sheet dept. supt.

RUSSEL J. STAINTON
Perkin Eng. plant mgr.

JAMES M. PLANTEN
joins Foundry Design

ERNEST A. SIEMSSEN
Selas div. chief eng.

1952, he succeeds the late **Chester H. Steele.**

Russel J. Stainton was named plant manager of **Perkin Engineering Corp.**, El Segundo, Calif. He was production manager of Elgin Instrument Co. **Jack E. Laisure** was made secretary-treasurer; **John F. Palinkas,** personnel manager.

Sterling Electric Motors Inc., Los Angeles, elected **John R. Eastman** vice president-engineering; **William E. Hoppock,** vice president-manufacturing; **Leonard A. Johnson,** vice president-finance.

Wesley D. Hamilton was elected chairman; **James B. Igleheart,** president and chief executive officer of **International Steel Co.**, Evansville, Ind. Mr. Igleheart, executive vice president, succeeds Mr. Hamilton as president.

John Asma was appointed general sales manager, **International Couplings Inc.**, Cleveland, division of Gabriel Co. He succeeds **C. N. Ruscitti,** resigned.

James M. Planten joined **Foundry Design Co.**, St. Louis (affiliate of Sorbo-Mat Process Engineers) as vice president and associate. He was vice president of Lester B. Knight & Associates Inc.

Ernest A. Siemssen, former production manager, was made chief engineer, Automatic Machinery Div., **Selas Corp. of America,** Dresher, Pa.

R. C. Conover was made western district works manager, Refractories Div., **H. K. Porter Company Inc.** He will supervise operations of western district plants, which include Laclede and Christy in St. Louis; Bessemer, Ala.; Ottawa, Ill.; and Canon City, Col.

William M. Haile was elected a vice president, **Union Carbide Corp.**, New York. He will supervise activities of three divisions: Linde Co., National Carbon Co., and Union Carbide Metals Co. **William B. Nicholson** was appointed president of Linde Co. to succeed Mr. Haile.

Thomas O. English was appointed general purchasing agent, **Aluminum Co. of America,** Pittsburgh, and its subsidiaries. He was assistant general purchasing agent.

Edward F. Schweich was elected president, **Lewin-Mathes Co.**, New York, division of Cerro de Pasco Corp. He succeeds **Richard H. Lewin,** recently made vice president of the parent firm. Mr. Schweich was executive vice president of Lewin-Mathes.

At the Sheet & Tin Div., Indiana Harbor Works, East Chicago, Ind., **Youngstown Sheet & Tube Co., Norman W. Tucker** was made superintendent of the No. 1 Tin Mill Cold Reduction Dept. **Paul J. Barliak** was made assistant superintendent, Sheet Mill; **Rudolph F. Spacek Jr.**, assistant superintendent, No. 2 Tin Mill.

G. W. Royce was made manager of the Toledo, Ohio, plant of **U. S. Reduction Co.** He was plant manager at East Chicago, Ind.

William D. Dickey was elected treasurer of **Universal-Cyclops Steel Corp.**, Bridgeville, Pa. He was executive vice president of Magnetics Inc.

James M. Murphy was made works engineer at the Pittsburg, Calif., Works, **Columbia - Geneva Steel Div.**, U. S. Steel Corp. He succeeds **William A. Marshall,** retired.

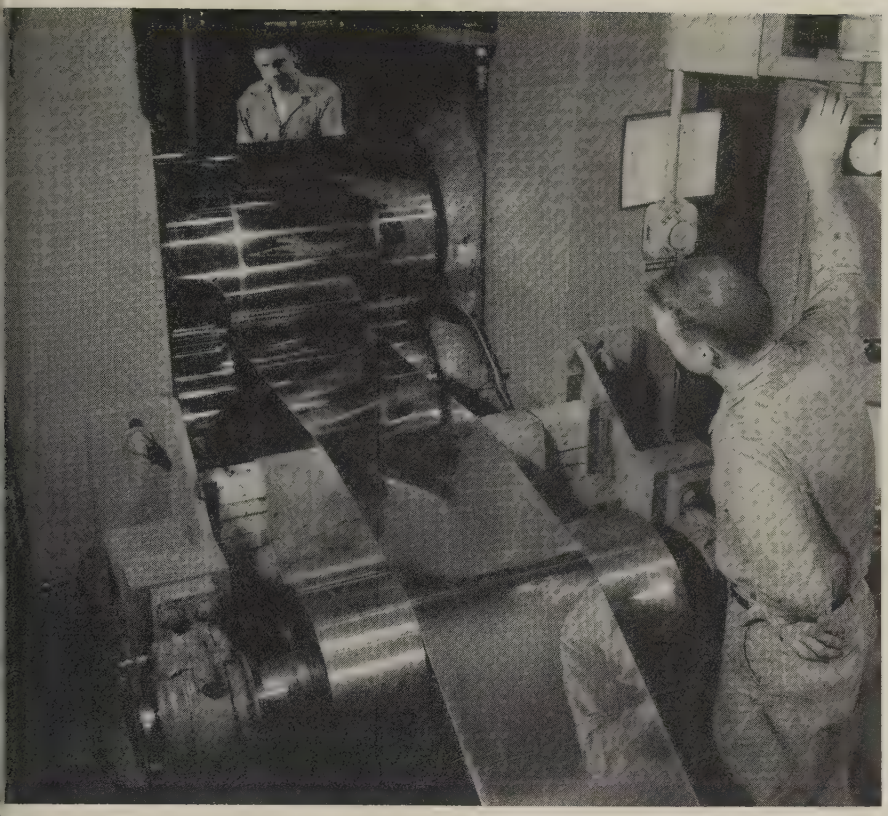
William T. Strickland was made New England district sales manager, Steel & Tube Div., **Timken Roller Bearing Co.** He is in Boston. Former sales engineer in the Detroit office, he is replaced by **Bruce R. Wise.**

Alfred A. Michaud joined **Nuclear Corp. of America** as vice president and general manager of its West Coast Div., Burbank, Calif.

OBITUARIES . . .

Stanley M. Brown, 57, Philadelphia plant manager, Industrial Div., **Electric Storage Battery Co.**, died May 25.

Carlton M. Wheelock, 72, former district manager of **Kennametal Inc.**, Milwaukee, died May 26.



Stainless steel strip rolls off new Coshocton mill as . . .

Universal-Cyclops Expands

UNIVERSAL-CYCLOPS Steel Corp., Bridgeville, Pa., has increased its stainless steel strip capacity 167 per cent to meet the steadily expanding needs of its customers—chiefly automobile and appliance manufacturers.

A new plant at Coshocton, Ohio, has a capacity of 20,000 tons of stainless strip a year. This supplements the 12,000 ton capacity of the Bridgeville mill which will place increased emphasis on all types of specialty strip (high speed and tool steel strip, high temperature metals strip, and magnetic metals strip).

• **New Facilities**—The Coshocton facility contains 137,000 sq ft. Equipment includes a 30 in., 4 high reversing mill which cold reduces strip as wide as 24 in. down to thicknesses of 0.012 in. It processes coils up to 18,000 lb at speeds as high as 1000 fpm.

Two coils of strip, each up to 24 in. wide and weighing as much as 18,000 lb, are handled simultaneously on the 627 ft annealing and pickling line.

Another major piece of equipment is a 2 high temper mill. It provides a lustrous finish (as seen in the picture above) and proper hardness.

Hot-rolled coils for the Coshocton plant are temporarily being supplied from the Bridgeville plant and from other sources. They will be supplied soon from a continuous strip mill at the Mansfield, Ohio, plant of Empire-Reeves Steel Co., a subsidiary of Universal-Cyclops.

• **Expansion Plans**—Over $8 million has been invested to date and firm commitments have been made for the expenditure of an additional $5 million at Coshocton this year. This is part of an over-all expansion program started in 1958 that will cost around $45 million through 1961.

Items to be added this year at Coshocton include a light gage annealing and pickling line. A two or three bay addition of 76,000 sq ft will be built to house a heavy gage annealing and pickling line, three bell type annealing furnaces for straight chromium grades of stainless, two continuous annealing furnaces for chrome-nickel grades, and a two stand pickling line.

Also included in this year's program is an appropriation of $11.5 million for the Mansfield plant. New equipment will include slab reheating furnaces, a 56 in., 4 high, cold reversing mill, and modifications of rolling equipment to permit processing of stainless. By the end of this month, the Mansfield plant will make its first shipment of hot-rolled stainless coils to Coshocton.

An additional $12.5 million to $17.5 million will be spent at Mansfield in 1960. Capacity of open hearth furnaces will be increased from 500,000 tons to 600,000 tons annually by using bigger ladles, better charging equipment, and (possibly) oxygen roof lances. An electric arc furnace of 60 to 80 ton capacity will be installed.

In 1961, $10 million to $15 million will be spent at various plants for continued expansion and modernization.

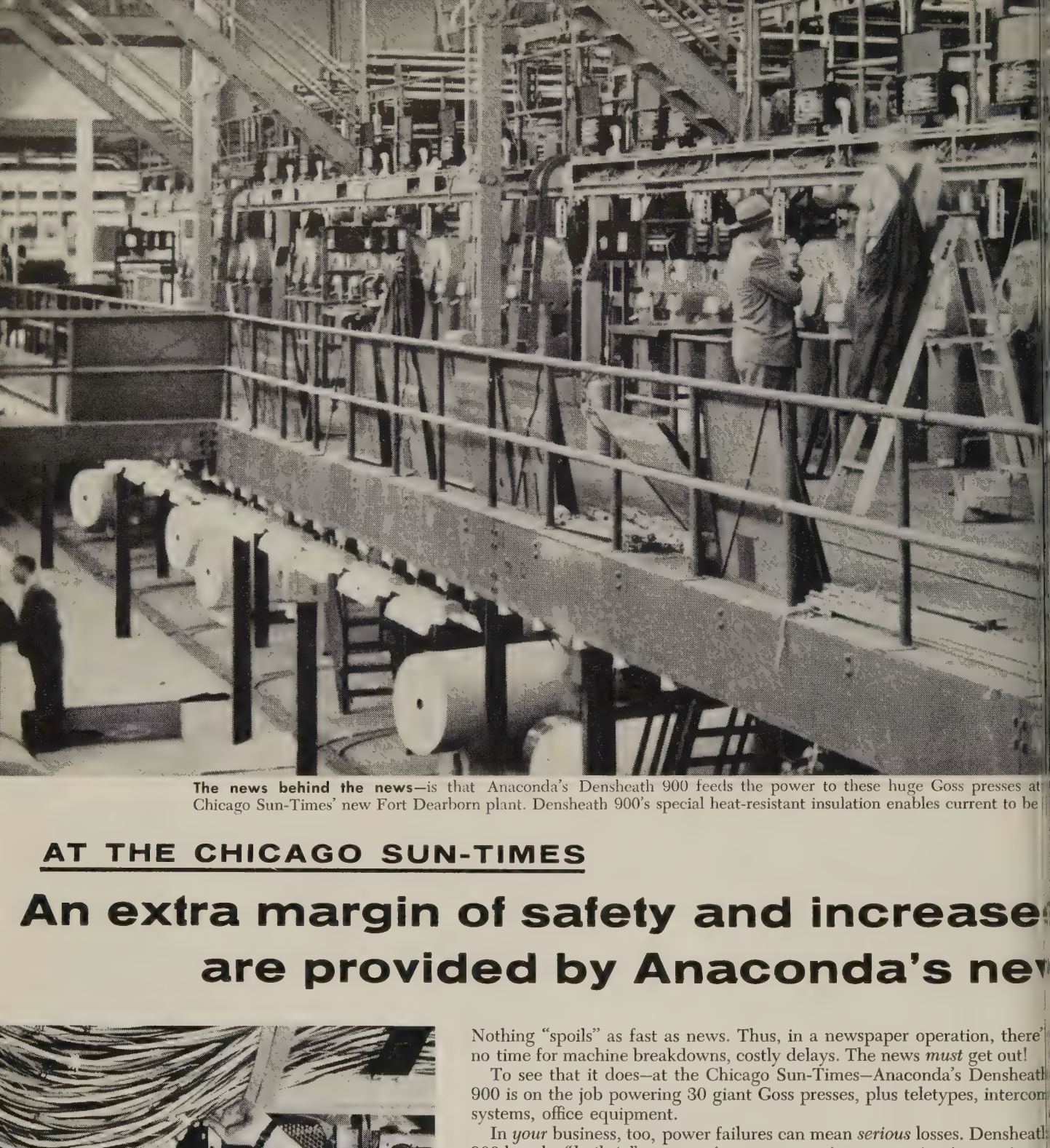
Youngstown Sheet & Tube Building Annealing Line

Youngstown Sheet & Tube Co., Youngstown, has started construction of a second continuous annealing line as part of its tin plate expansion program at the No. 2 tin mill, Indiana Harbor Works, East Chicago, Ind. It will be in operation in about two years. Rated capacity: 60 tons an hour. The line represents an investment of more than $10 million.

Two buildings will be erected, providing 93,000 sq ft of floor space: One is for the annealing line and the other for coil storage. About 33,000 ft of piling will be required to provide solid footings for the buildings. They'll also require about 2665 tons of structural steel.

The line will be 560 ft long (including the 115 ft furnace) compared with the present unit which is 390 ft. At the entry end will be two reels, strip handling and cleaning equipment, and a 70 ft loop-

(*Please turn to Page* 122)



The news behind the news—is that Anaconda's Densheath 900 feeds the power to these huge Goss presses at Chicago Sun-Times' new Fort Dearborn plant. Densheath 900's special heat-resistant insulation enables current to be

AT THE CHICAGO SUN-TIMES

An extra margin of safety and increase are provided by Anaconda's ne

Electrician laces in Anaconda Densheath 900 for a 50-hp press-drive motor. In addition to three master panels, each press has its own control panel.

Nothing "spoils" as fast as news. Thus, in a newspaper operation, there' no time for machine breakdowns, costly delays. The news *must* get out!

To see that it does—at the Chicago Sun-Times—Anaconda's Densheath 900 is on the job powering 30 giant Goss presses, plus teletypes, intercom systems, office equipment.

In *your* business, too, power failures can mean *serious* losses. Densheath 900 has the *"built-in" extra performance* your important circuits require.

Tough, flexible Densheath 900, then, deserves attention. This top quality industrial wire is sound insurance against power failure. Here's why

1 **LONG LIFE.** Consistently superior performance throughout the years under the severest operating conditions.

2 **HIGH HEAT RESISTANCE.** Can safely carry higher currents under exposure to higher ambient temperatures.

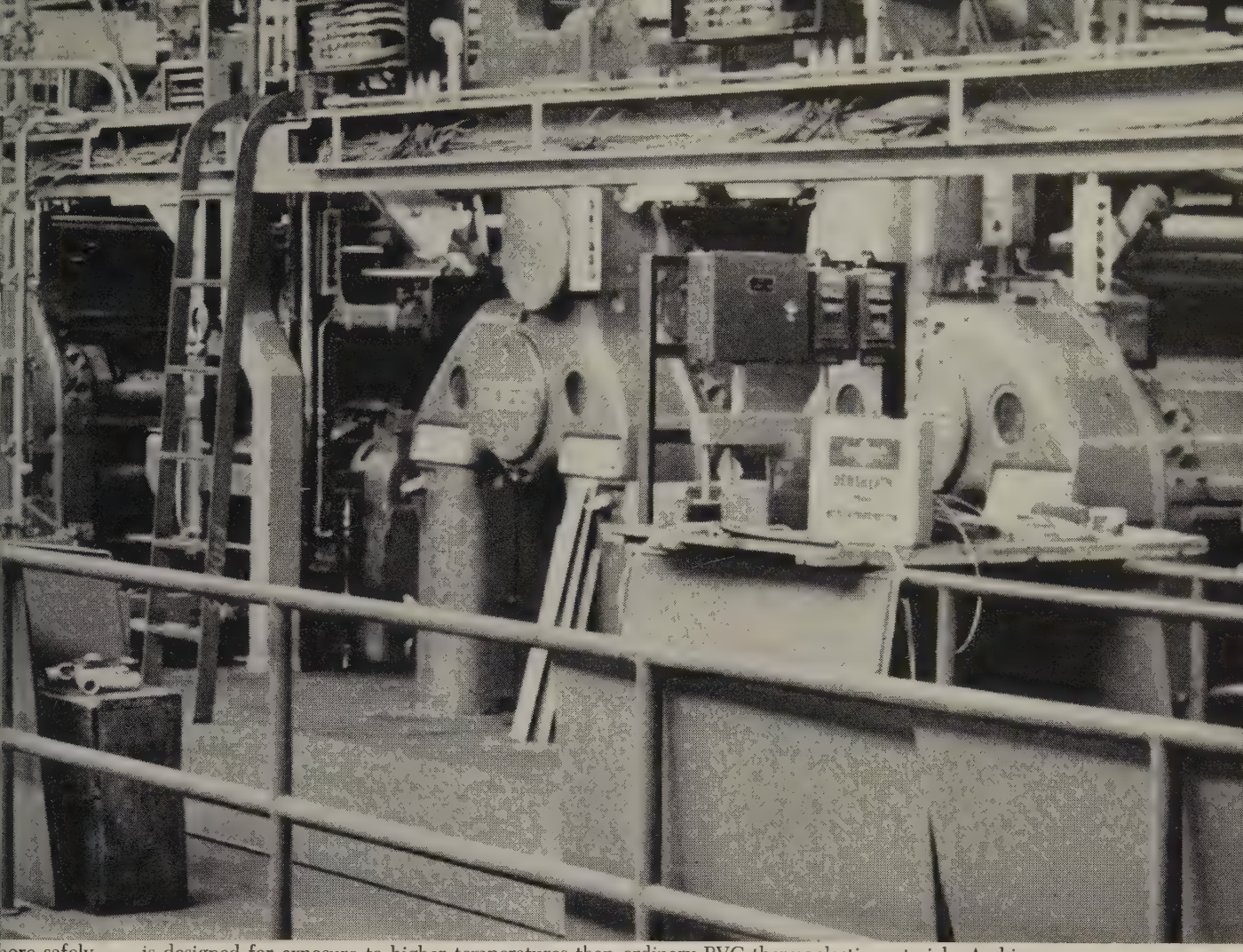
3 **CHEMICALLY STABLE.** Retains its electrical and physical characteristics despite exposure to cutting compounds, lubricants, most acids and alkalies.

4 **MOISTURE RESISTANCE.** The presence moisture does not affect the satisfa tory performances of Densheath 90

5 **EASY TO INSTALL.** Flexible, eas formed, resists tearing, abrasion a stretching, strips easily.

6 **LESS "DRAG."** Coated with exclusi new "slipper" coat which offers le drag, greater resistance to scrapin

If yours is a plant now going to higher ambients, or higher temperature operations in corrosive atmospheres, Densheath 900 will be of particular interest. It provides an extra margin of safety for those "hot spots" which



hore safely . . . is designed for exposure to higher temperatures than ordinary PVC thermoplastic materials. Archi-for the new building were Naess and Murphy, Chicago. Electrical Contractor: White City Electric Co., Chicago.

rotection against power failures dustrial wire – Densheath 900!

ways occurring . . . assures superior performance from your wiring. ontractors and distributors, Densheath 900 offers another advantage: hinates duplicate stocks, since the one wire can be used for building ruction, appliance and machine tool applications. See the Man from onda or your Anaconda Distributor about Densheath 900. Anaconda & Cable Co., 25 Broadway, New York 4, N. Y. 58304

RATINGS

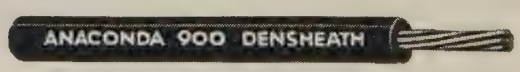
he exceptional heat, chemical and moisture resistance of Den-heath 900 enables it to satisfy the following:

- *U/L requirements for type TW*
- *ASTM D 734 Polyvinyl Insulating Compound*
- *90C Switchboard, Appliance and Machine Tool Wiring*
- *National Machine Tool Builders Association Specifications*

THE FROM **ANACONDA®**

FOR **DENSHEATH 900**

LIVE BETTER ELECTRICALLY



DENSHEATH 900

Densheath 900, the 90C industrial wire, is the result of more than 20 years of Anaconda's research and development in the field of thermoplastic wire and cable. Its specially heat-resistant insulation handles current more safely . . . it is designed for exposure to higher temperatures than ordinary PVC thermoplastic materials.

Underwriters' Laboratories Inc. Labeling: Type TW, Oil Resistant 60 C. Sizes 14 Awg through 4/0-Awg also labeled as Appliance Wiring Material for use at temperatures not exceeding 90C, or not exceeding 60C where exposed to oil.

(*Continued from Page 119*)

ing tower to store 1600 ft of strip. Another 70 ft tower will be at the exit end for storing 1150 ft of strip.

J&L Building Warehouse

Jones & Laughlin Steel Warehouse Div. is constructing a steel service center in suburban Cleveland at 16500 Rockside Rd., Maple Heights, Ohio. Cost: More than $1 million. When completed and equipped around Jan. 1, it will replace the division's present facility at 12875 Taft Ave., Cleveland. George L. Stewart is president of this division of Jones & Laughlin Steel Corp., Pittsburgh.

Schedules Plant Opening

The new Anniston (Ala.) Div. of Anchor Metals Inc., Hurst, Tex., will begin partial production around Aug. 1. The firm designs and manufactures steel electrical transmission towers and switchboard structures.

Enters Steel Casting Field

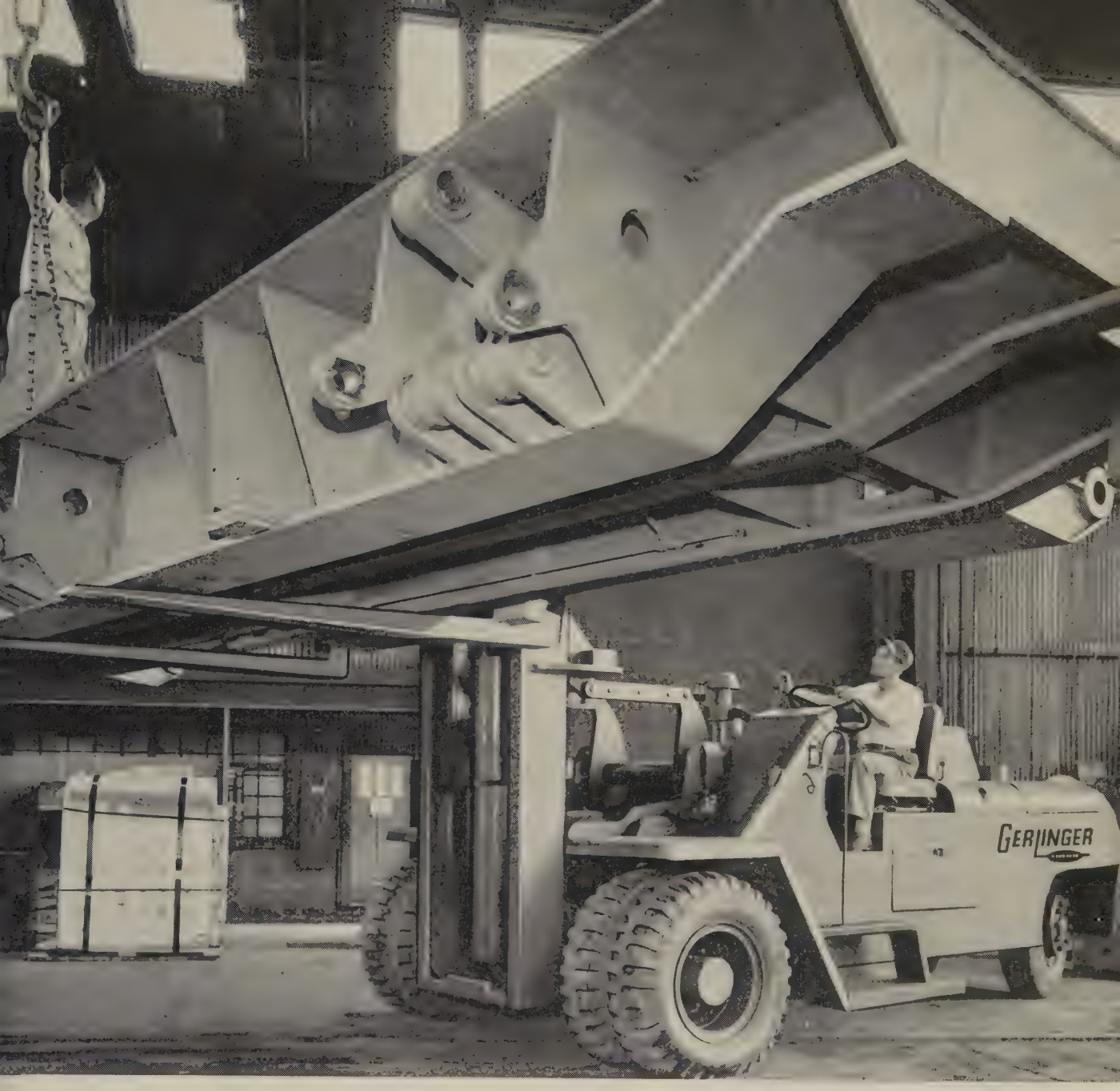
Goslin-Birmingham Co., Birmingham, has started manufacture of its own steel castings, in addition to gray iron. The company, a subsidiary of Commercial Credit Co., recently installed a 22 ton electric furnace. Previously, it purchased needed steel castings. The company makes specialized heavy machinery.

Armco Expands at Butler

Armco Div., Armco Steel Corp., Middletown, Ohio, has begun a $17 million program for additional stainless steel facilities at its Butler (Pa.) Works. The project includes installation of new machinery and equipment and building improvements for a new unit to be known as Plant No. 2; and relocation of stainless steel production equipment from Plant No. 1 to Plant No. 2. Stainless steel melting, rolling, and some processing facilities will remain in Plant No. 1.

The project, to be completed late next year, will enable Armco to produce wider closer-tolerance stainless steel sheets and coils, says C. G. Davies, vice president-operations, Armco Div. Heavier coils also will be available.

The new facilities will include a



Savings match the load!

You're seeing a Gerlinger Fork Lift Truck showing some of the remarkable stamina and stability that causes users to say, *"Our first choice is Gerlinger for the BIG JOBS!"*

What you can't see till you own one are the tremendous savings you gain. As you move more tons per hour . . . at much less cost . . . your profits increase in proportion. *Gerlinger* offers standard gas-powered, pneumatic-tired, *Job-Proved* fork lift trucks that handle as much as 40,000 pounds per trip. (Diesel engines optional.)

Want to see how savings match the load? Ask for Certified Job Studies covering your specific handling operations—and new Gerlinger Specifications Folder *GSS*. Write Towmotor Corporation, Cleveland 10, Ohio or Gerlinger Carrier Company, Dallas, Oregon.*

TOWMOTOR ®
THE ONE-MAN-GANG

-GERLINGER

LEADERS FOR 40 YEARS IN BUILDING
FORK LIFT TRUCKS, CARRIERS AND TRACTORS

*Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation

Sendzimir cold reduction mill, a rewind line, coil grinder line, an anneal and pickle line, and material handling facilities.

Plans Research Center

Warner & Swasey Co., Cleveland, will construct a research center in Solon, Ohio. It will comprise 40,000 sq ft of floor space and is scheduled for completion by the end of this year.

Master Lock Expanding

Master Lock Co. is constructing an addition to its Milwaukee plant. Cost: More than $300,000 for the building and $200,000 for machinery and equipment. The firm produces padlocks.

ASSOCIATIONS

American Iron & Steel Institute, New York, re-elected officers and named C. M. White a vice president. Officers are: Benjamin F. Fairless, president; Max D. Howell, executive vice president; William M. Akin, A. B. Homer, and C. M. White, vice presidents; George S. Rose, secretary; E. O. Sommer Jr., treasurer; C. M. Parker, assistant vice president; and F. A. Coombs, assistant secretary. Two honorary vice presidents were named: John T. Whiting and C. F. Hood.

American Iron Ore Association, Cleveland, re-elected these Clevelanders to guide the group for the coming year: Herbert C. Jackson, Pickands Mather & Co., chairman of the board; Walter A. Sterling, Cleveland-Cliffs Iron Co., chairman of the executive committee; and Hugo E. Johnson, president. New directors are: C. H. Dewey, Republic Steel Corp., Cleveland; C. B. Jacobs, Inland Steel Co., Chicago; and R. Q. Archibald, North Range Mining Co., Negaunee, Mich. All other officers and directors were re-elected.

Society of Reproduction Engineers, Detroit, elected these officers: President, M. P. Myers, North American Aviation Co., Columbus, Ohio; secretary, W. J. Burdick, U. S. Naval Ordnance, Forest Park,

ll.; and treasurer, W. M. Hanselman, Chrysler Corp., Highland Park, Mich. Vice chairmen are: Albert Prioletta, New York Port Authority, New York; H. E. Wilson, Oil Well Supply Div., U. S. Steel Corp., Dallas; and S. E. Enright, International Business Machines Corp., Poughkeepsie, N. Y.

NEW OFFICES

Campbell Steel Co. opened its general sales office at 3323 Mercer St., Houston, under the direction of C. E. Praeger Jr., vice president and general sales manager. The firm has fabrication plants and steel service centers in San Antonio and Corpus Christi, Tex.

Acme Industries Inc., Jackson, Mich., manufacturer of air conditioning and refrigeration systems, opened a direct factory sales office at 1485 Bayshore Blvd., San Francisco 24, Calif.

CONSOLIDATIONS

Merger of **D. S. Kennedy & Co.,** Cohasset, Mass., and **Anchor Metals Inc.,** Hurst, Tex., has been proposed. If approved by stockholders, Anchor would be operated as a division of Kennedy. Anchor makes electrical transmission towers; Kennedy, large microwave antennas.

Standard Steel Corp., Los Angeles, purchased **Cambridge Corp.,** Lowell, Mass., a subsidiary of Carrier Corp., Syracuse, N. Y. Cambridge manufactures equipment for the storage and transportation of liquefied gases at low temperatures. The firm also does defensework related to the missile program.

Rockwell-Standard Corp., Coraopolis, Pa., purchased **Kerrigan Iron Works Inc.,** Nashville, Tenn., producer of lighting standards.

Textron Inc., Providence, R. I., acquired **Schafer Custom Engineering,** Burbank, Calif., manufacturer of automation equipment for the

(*Please turn to Page* 128)

Earthmoving muscles from tubes of steel

A construction site springs to life as earthmoving equipment tugs, scoops, heaves and rips away at the earth's skin. It's grueling work!

That burly dozer. It's precision built! It's strong! Its m
sive blade can tear the side out of a hill. Yet, it's nim
too. In spite of a crab-like figure, it can stop with a
back off, spin, dig in and charge with the force of a gal
ing rhinoceros.

Power is jammed into these machines. That's
they're built with the toughest, most durable material
the world. For years, leading manufacturers have cho
USS Shelby Seamless Mechanical Steel Tubing for
draulic cylinders, tractor pins, bushings and more t
100 other vital parts in earthmoving, rockmoving, grad

ll types of heavy mobile equipment. *Why?* Because
y Seamless Tubing is ideal for the fabrication of
ne parts subject to bruising performance and long

S Shelby Seamless Mechanical Steel Tubing is an-
product from the world's largest manufacturer of
r materials. For more than 80 years, National Tube
een foremost in building and industrial pipe appli-
s. For more information, write to National Tube Di-
. United States Steel, 525 William Penn Place, Pitts-
30, Pennsylvania. *USS and Shelby are registered trademarks*

National Tube
Division of
United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Supply Division • United States Steel Export Company, New York

(*Continued from Page* 125)

radio and television industries. Textron is also acquiring **Randall Co.**, Cincinnati, producer of automotive specialty items, such as stainless steel trim and miscellaneous parts for appliance manufacturers.

NEW ADDRESSES

Mennel Milling Co. moved its general offices to 128 W. Crocker St., Fostoria, Ohio.

Gendron Wheel Co. will move from its plant in Perrysburg, Ohio, to a site in Archbold, Ohio, about July 1. The company makes hospital equipment and wheelchairs.

NEW PLANTS

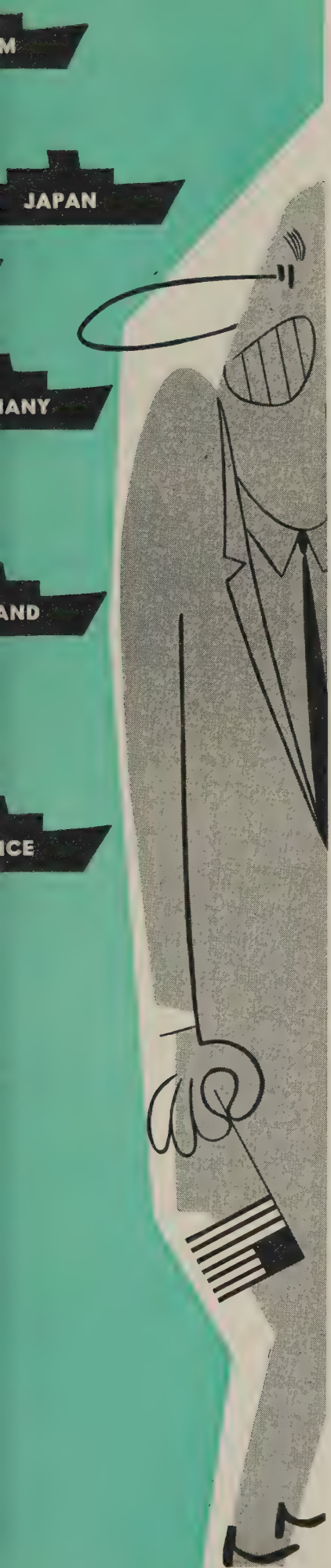
Gates Rubber Co., Denver, is constructing two $350,000 warehouses. One in Kansas City, Kans., will have 40,000 sq ft of space. Lyle Helwig will be in charge. The Portland, Oreg., facility will have 50,000 sq ft. It'll be under the direction of Bill Elliott.

Jamison Steel Corp., San Francisco, opened a branch service center in Santa Clara, Calif.

General Electric Co., Schenectady, N. Y., opened a facility at Paterson, N. J., for the manufacture of standard, fractional horsepower gear motors. Cost: More than $250,000. J. Stokes Gillespie is general manager of the firm's Gear Motor & Transmission Components Dept. at Paterson.

Wheeling Corrugating Co. is opening its metal culvert shop at Southampton, Pa. The firm is a subsidiary of Wheeling Steel Corp., Wheeling, W. Va. David L. Kendrigan is manager of Wheeling Corrugating's Philadelphia branch, which includes a warehouse, sales organization, and the culvert plant. L. P. Burke is superintendent of the Southampton shop.

Gorman-Rupp Co., Mansfield, Ohio, will build a 14,000 sq ft pump manufacturing plant at St. Thomas, Ont. Completion of the $100,000 project is set for mid-August.



Meeting Foreign Competition

FOREIGN COMPETITION is nipping hard at the heels of more and more metalworkers.

Only a few have been seriously injured. But the quickening contest for domestic and world markets portends more injuries—perhaps even some casualties.

Last year's export-import records point up the situation. U. S. exports dropped more than 14 per cent below 1957's, while imports declined less than 2 per cent. The impact in many segments of metalworking was far more severe. Imports scored amazing gains, while domestic firms fought a sales slump. (See chart, Page 134.)

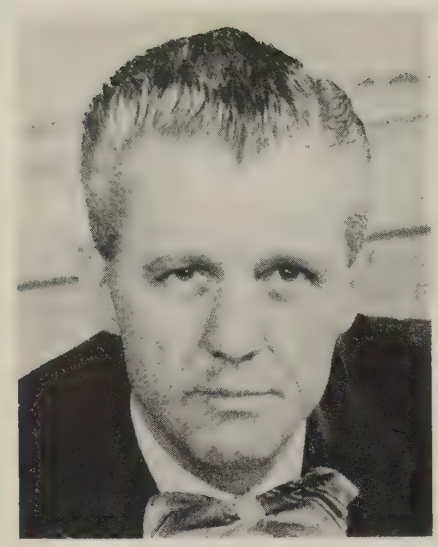
Unquestionably, the major competitive factor is price, brought about primarily by the tremendous wage differential between domestic and foreign labor rates. Other basic competitive factors are also behind the trend.

The challenger is formidable. His production facilities—rebuilt in the postwar period—are modern and highly efficient. He often has surplus capacity for markets outside his country. Technologically, he has kept pace with us. He is producing well designed, high quality products with a good number of innovations, and he is displaying a lot of marketing knowhow both here and abroad.

What are you doing about it? A check of the import figures of your industry or those you serve (they're available from your Commerce Department field office) should indicate the urgency of your situation. Many metalworkers are already girding for the challenge—their activities may suggest ideas and approaches for you.

The task isn't easy. It runs the gamut—from political action, to basic competitive approaches, to go-

Take Advantage of Your Yankee Knowhow to Combat Foreign Competition . . .



New Product Design: First Line of Attack

Last month, Harley-Davidson Motor Co. entered the motor scooter field, a market well penetrated by foreign manufacturers.

"The foreign producers actually helped develop the American market," says William J. Harley, vice president-engineering. "When we decided to enter the market, we knew we had to come up with a scooter to compete not only in price but in style and performance."

These features helped Harley-Davidson reach its objective: Tubular frame construction; horizontally mounted motor, permitting better cooling without a fan; and an automatic transmission which is produced for 60 per cent less than the conventional three-speed type.

Fight Price with Service, Other Marketing Intangibles

"Price is still the big factor in foreign competition in fencing, barbed wire, and nails," explains William H. Getz, merchant product sales manager, Keystone Steel & Wire Co.

"We're stepping up our service to wholesalers and dealers. For example, in our radio and television advertising we're helping the dealer by mentioning his business location along with our brand advertising. We're also providing sales training programs and point of sale aids."

Keystone adds a little glamour to an otherwise prosaic product by painting the top of its fencing and fence posts and the barbs on barbed wire with red paint. Such brand identification factors assist the customers in buying domestic products.

ing overseas. But, basically, it takes a realistic approach, a recognition of all the factors (we can't ignore our involvement in international affairs), plus hard work.

Hit It from Every Angle

The experience and philosophy of William Davidson, president of Harley-Davidson Motor Co., Milwaukee, is a good example. "When the British devalued their money in 1949, they gained an overnight price advantage of 25 to 30 per cent over us," Mr. Davidson relates.

"By 1951, the pressure reached the point where we decided to go to Washington and seek relief from the Tariff Commission. After several months of negotiations—often tying up as many as 19 men—we lost our appeal and decided we were wasting our time. Imports kept gaining; more countries entered the market—Germany, Italy, Austria, Japan; and they began introducing more models of scooters and motorcycles than our market had ever known before.

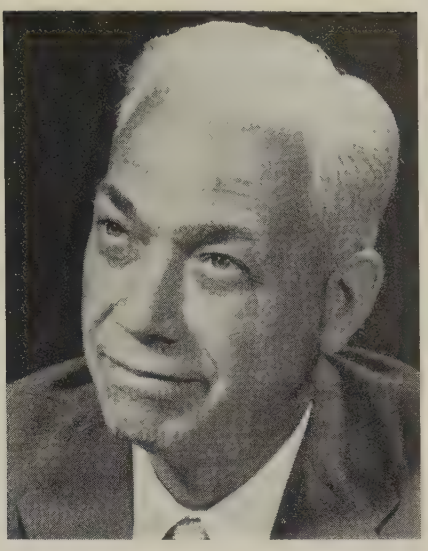
"We knew then it was a case of rolling up our sleeves or going out of production," emphasizes Mr. Davidson. "We're hitting the problem from every angle now—modernizing our production facilities, revamping worker incentive programs, improving our engineering to cut costs and improve product performance and appeal, upgrading and expanding our dealer organization, offering better financing

ush for Improved Depreciation rovisions

Depreciation reforms will help metlworking management meet the hallenge of foreign competition, ays Donald P. Else, comptroller, merican Motors Corp.

"The biggest advantage of changes n our depreciation regulations will e to encourage manufacturers to inest in more automatic equipment hat will save labor costs and enable hem to compete against foreign rices."

What kind of depreciation does Mr. Else favor? "I think the declinng balance method, where depreiation is greatest in the first year nd smaller each succeeding year, dvantages over establishing a new lant or settling up licensing arangements.

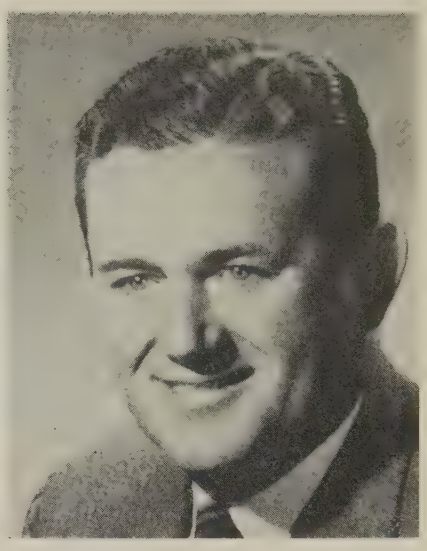


Buy American—Practice It; Sell It to Customers

Management should adopt a firm policy against the purchase of foreignmade products, believes D. W. Blend, general manager of Wolverine Tube Div., Calumet & Hecla, Inc.

His industry—copper fabricating —has watched its export business go tumbling while imports have skyrocketed.

In addition to its strong buy American policy, Wolverine is waging an active campaign to sell its customers on the same practice. The firm has prepared several booklets appealing to construction contractors, plumbing wholesalers, union plumbers, and all others who buy, handle, or install its copper tubing and other products.



Join 'em To Protect World Market Position

"One of the best ways to maintain your percentage of world markets is to go overseas and operate under the same conditions as the foreign competitors," points out D. J. O'Connell, president of A. O. Smith International. "You not only obtain the advantage of their wage rates, but there are often tax advantages too."

His firm, like many other companies in the metalmaking field, is negotiating with several foreign companies and governments to set up joint operations.

Many executives feel that buying into foreign companies offers definite advantages over establishing a new plant or setting up licensing arrangements.

---

ervice to dealers and customers. ast month, we introduced a new roduct—our first entry into the otor scooter field."

As Harley-Davidson's experience uggests, there is no first or best tarting point.

Wages—the Big Handicap

The biggest apparent handicap is ne wage rate differential. Some etalworkers view the current steel egotiations as the most critical to date. At stake: Inflation of the U. S. dollar and the increasing impact of foreign competition in domestic as well as world markets. Roger Blough, U. S. Steel Corp.'s chairman, highlights the competitive threat to the steel industry with these figures:

"Our nation's proportion of world steel production dropped from 54 per cent in 1946 to less than 30 per cent last year. The American employee, using our tools of production, turns out about 1.5 times as much steel as his German counterpart. But American pay and benefits amount to more than 3.5 times that of the German workers. The result: Unit employment costs are 2.5 times greater here than in Germany."

Brooks McCormick, executive vice president of International Harvester Co., points up this situation in his industry: "America's $2 billion farm equipment industry, long time leader in exporting, is rapidly turning into a major importer . . . in

Foreign Metalworkers Gain in U. S. Markets

Imported Product	1954	1955	1956	1957	1958
Wire Rods (net tons)	39,849	47,762	64,192	54,369	181,283
Concrete Reinforcing Bars (net tons)	163,977	158,969	173,300	160,371	472,741
Woven Wire Fence (net tons)	10,436	13,136	21,991	30,135	39,671
Brass Mill Products (millions of pounds)	50.9	73.5	88.6	108.7	153.7
Automobiles, New (millions of dollars)	$44.8	$69.2	$126.5	$301.3	$486.8
Radio Apparatus & Parts (millions of dollars)	$2.5	$3.3	$8.4	$15.3	$28.1
Typewriters (millions of dollars)	$5.5	$7.7	$12.7	$16.9	$19.6
Electrical Machinery, Parts (millions of dollars)	$21.2	$26.7	$49.6	$81.4	$86.9
Machine Tools (millions of dollars)	$22.3	$16.2	$24.6	$36.3	$28.1

Source: Department of Commerce.

the first ten months of 1958 over $16.5 million worth of tractor parts alone was shipped into the U. S.—$2 million more than for all of 1957. Exports of tractors and farm equipment dropped from $311.8 million in 1953 to $265.9 million in 1957.

"We calculate our gross average wages at $3.13 per hour, including fringe benefits. They compare with 75 cents in our French subsidiary, 74 cents in Britain, $1.09 in Australia, and 65 cents in Germany."

No metalworking executive is suggesting a wage cut. But those contacted by STEEL are urging that "this is the year to hold the line." Most metalworkers are highly complimentary of the steel industry's "hold-the-line" approach in today's negotiations. Commented the vice president of a medium-sized plant: "Big steel is in a good position to take a strike to make its hold-the-line policy stick. We'll back them up with a firm stand in our plant. But if they can't halt the wage spiral, certainly we smaller fabricators can't be expected to change the pattern."

Opportunity Overseas

The drive to meet foreign competition in world markets has produced a real scramble overseas. Literally hundreds of metalworkers—from the giants down to some fairly small companies—are investigating opportunities in Western Europe, South America, Japan, and other areas.

Again, wage competition is only part of the problem. Compounding the domestic exporters' headaches are tariff barriers and dollar exchange problems. Most countries trying to boost industry exports give their firms better and faster financing terms than American companies. The European Common Market promises tariff changes which will make exporting to it increasingly difficult.

Most of the emphasis is on trying to establish joint ventures—domestic firms teaming up with foreign companies. Some foreign government regulations make the approach almost a necessity. It also has many advantages over establishing a wholly owned subsidiary. The chief ones:

1. It takes less capital.
2. In most cases, it causes less drain on the management manpower of the domestic company. Look for a firm with a record of good management, stress the experts.
3. The crossfertilization of ideas between their engineers and yours is a definite plus.
4. Relying primarily on "nationals" to operate the business right from the start has obvious public and government relations advantages.
5. Many foreign companies are eager for joint venture arrangements with American firms.

Warner & Swasey Co., Cleveland, recently joined hands with Asquith, a London tool builder. Walter Bailey, W&S president, says there's a growing market abroad for high capacity American machine tools, even though they're priced higher than European equipment. "We feel that in about three years we'll we able to sell machines for 30 per cent less than if we made them here in Cleveland and shipped them abroad."

Licensing foreign companies to make your products is also widely practiced. To many metalworkers, this has been an effective method of participating in markets that might not be easily available otherwise. A few executives report unhappy experiences — government regulations usually limit your fee or percentage; you're transferring your skill and knowhow for less than your resale commission; and unless your contract has teeth in it, the licensee might decide to terminate the contract and pick up where you left off.

Really Know Your Market?

When was the last time you took a fresh look at your product and market? Part of the success of the foreign competitor has been in capturing a market largely being ignored by domestic manufacturers.

The small car is a good example. Certainly, American Motors Corp.'s George Romney did the marketing spadework. But many contend that foreign carmakers developed the market to the point where the Big Three are interested.

"Our sewing machine industry ignored the zigzag sewing machine when it was introduced in Europe," points out R. E. Isaacson, vice president of White Sewing Machine Corp. "The American housewife, we reasoned, differed from her European counterpart and was not interested in fancy stitching and embroidery. It didn't take long after the Italian-built Necchi machine invaded our domestic markets to realize our error."

Harley - Davidson officials are quick to credit the foreign scooter builders for helping to develop that market. "They introduced a little glamour into the product," says William Harley, vice president-engineering. "People who wouldn't consider riding a motorcycle found the motor scooter appealing. We watched the market for about five years before deciding to enter it.

"When we did, we knew we had to do two things to be successful: 1. We had to design a product to compete pricewise. 2. We had to come up with better styling and performance characteristics." Harley-Davidson engineers took advantage of as many competitive avenues as possible. A Fiberglas body was used because of more economical tooling costs. By mounting the motor horizontally, better cooling was obtained which in turn eliminated the need for a fan. One big advantage: Automatic transmission.

"Americans have shown that they are automatic conscious," explains Mr. Harley. "Europeans are not, and consequently most of their manufacturers provide only standard gear transmissions. We felt an automatic transmission would definitely be to our advantage saleswise. It also proved to be a good competitive feature in another way —it cost us less to produce."

Product innovation, of course, provides one of your best weapons

Why Imports Are So Cheap

(All totals do not add up because some cost categories are not reported separately)

Foreign Industry Costs	No. Lower than U. S.	No. Higher or Same
Fabricated Metal Products (21)		
Unit Costs	13	8
Material	7	14
Labor	20	1
Overhead	12	9
Machinery—Except Electrical (21)		
Unit Costs	12	9
Material	6	11
Labor	12	5
Overhead	7	10
Electrical Machinery (13)		
Unit Costs	6	7
Material	2	10
Labor	12	0
Overhead	8	4
Instruments, Related Products (9)		
Unit Costs	4	5
Material	2	5
Labor	5	2
Overhead	4	3
Misc. Manufacturers (12)		
Unit Costs	8	4
Material	7	4
Labor	7	2
Overhead	8	1
Other Manufacturers* (14)		
Unit Costs	11	3
Material	6	5
Labor	9	2
Overhead	7	4

*Includes textile-mill products; leather, stone, clay, and glass; primary metal products; and transportation equipment. Insufficient data were reported to warrant separate treatment under Standard Industrial Classifications.
Source: National Industrial Conference Board, Study #61.

against domestic as well as foreign competitors. Research and development work is expensive, but many aggressive firms refused to cut such spending during the recession because it pays off. Bell & Howell Co.'s introduction of the automatic electric eye camera gave it a year and a half lead over foreign competitors which were chalking up large gains. B&H's sales last year were 13 per cent above 1957's—over 82 per cent of the sales represented products not being made five years ago.

Your greatest weapon in combating foreign competition in the domestic market is your marketing technique, emphasize most executives. Many also believe that this is the least developed activity in our business and industrial complex. Increased foreign competition could be the necessary stimulant to new concepts in marketing.

You Have These Advantages

Take a look at your advantages today—particularly in industrial products. Proximity to the customer permits you to provide:

1. Better engineering service.
2. Better availability of parts and maintenance service.
3. Better financing arrangements.
4. Better training of the customer's personnel in the use of your product.
5. Better liaison with the customer to help solve his problems and to offer extra service during an emergency.
6. Better sales assistance if he's a dealer or distributor or if his product is a component.

Chain Belt Co., Milwaukee, had this experience with industrial and bicycle chains: "We lost practically all the bicycle chain business to foreign manufacturers," says O. W. Carpenter, president. "Price is the first factor. The absence of a need for service of any kind is the second.

"But we don't feel that industrial chains will go the same route. We've heard of some firms trying out foreign industrial chains, but most equipment producers value too highly top quality, part stocking, engineering assistance, and the other services provided by domestic producers to risk the price advantage. It's true, the foreign producers may develop the same types of services—if they do, their costs are bound to rise, and the price advantage will shrink."

Stepped-up emphasis on engineering services has also paid off for National Acme Co., Cleveland. "We're stressing the secondary operations in connection with our screw machines," Edward Ranney, assistant sales manager, points out. "Our sales engineers are assisting customers in solving cost problems by trying to combine such operations as flame hardening, cross-drilling and tapping, burring, and milling into continuous operations with our equipment."

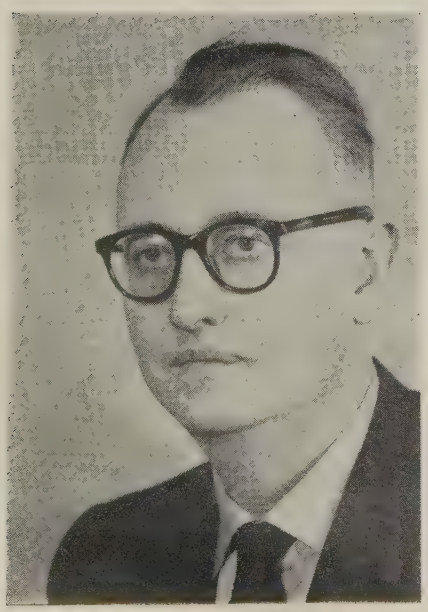
Sell Hard Overseas

Domestic firms are finding that their sales efforts must be upgraded to compete successfully in the export market. "The days of appointing a distributor, handing him a catalog and price list, then giving him your blessings are gone," laments one metalworker.

Foreign equipment builders are applying many of our best domestic sales techniques. They're visiting customers and distributors to learn their wants. Some German equipment builders use selling teams

How it looks from the other side . . .

A European Views American Competition



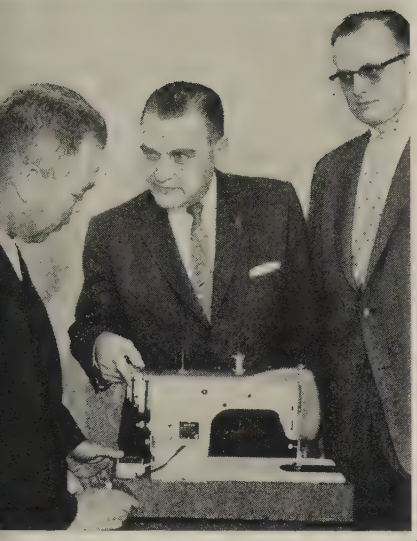
STEEL asked its European correspondent, Dr. Herbert Gross of Dusseldorf, Germany, to tell you how the European metalworker views his "foreign" competitor, the American. Here are his observations.

The relationship of European and American industry should be judged differently from now on. American firms are developing a kind of global division of labor with their development of supply sources here to export components back to America or to supplement their production by European specialties.

The advantage of production in Europe is partly based upon a different style of product for which large scale production has been developed here. Such products cannot be produced economically in the U. S. On the other hand, the lower wage rates in Europe are increasingly wedded with the most modern technology to enhance the advantage of our exports. At the same time, the European Common Market is transforming European industry from small scale to large scale production—resulting in additional productivity benefits.

Those things should not be judged in the antiquated term of cut throat competition but of a new international division of labor with many mutual branch plant building and licensing agreements on both sides of the Atlantic.

Europeans, incidentally, are concerned over American competition: Not of American exports to Europe but of American branch plants and arrangements with European firms manufacturing with U. S. knowhow.



White Sewing Machine officials, Dodge E. Barnum (center) and R. E. Isaacson (right) confer with a representative of a Japanese firm on the design of a new machine

White Sewing Machine Fights To Save a Traditional Name

Foreign competition in the sewing machine market came in two waves:

1. About 1950, the Italian-built Necchi introduced zigzag sewing to American housewives.

2. Two years later, the Japanese brought in a machine comparable to American models but at a substantially lower price.

White Sewing Machine Corp., along with the other domestic producers, watched the Necchi to see if the new feature was a flash in the pan or whether Americans really wanted it. By the time the Japanese entered the market, the industry knew that foreign competition was more than a nuisance—it was a threat to survival. Imports rose from $17.7 million in 1954 to $28.3 million in 1957.

The near-fatal blow came to White in the spring of 1957 when it lost a contract with one of the major mail order firms which was taking about 50 per cent of its production. "We found ourselves in this predicament," relates R. E. Isaacson, vice president: "We had an excellent name (traditional in the sewing machine market), a reputation for quality, and a marketing organization. But we could not produce machines at a competitive price."

White solved its dilemma by going to Japan. It has arrangements with several manufacturers to produce sewing machines built to White's specifications. They are imported into White warehouses where they are inspected, electric motors are attached, and units are installed in cabinets.

How has the approach worked? "We expect to do a $20 million volume this year, compared with our peak domestic volume of nearly $31 million. Unitwise, sales will be about the same," points out Dodge E. Barnum, director of merchandising.

White officials are emphatic: "We are jealously protecting the White name and reputation for sewing machines. We'll maintain an engineering organization to keep working with the Japanese engineers in designing and building machines to meet demands of the American market.

"We feel our manufacturing arrangement has definite advantages over joint ownership in foreign plants. It keeps us flexible. We are in a position to move our production, if necessary. Conceivably, we might some day find it practical to produce again in this country."

which include financing experts and technical people.

Warner & Swasey places specialists in foreign dealer organizations. They spend a year or two in the Cleveland plant training for such jobs. The foreign field is not a place to send recent graduates from apprentice programs, officials emphasize.

U. S. engineering knowhow is still in demand in the foreign market, and domestic firms are capitalizing on it in some installations of large, custom-built processing equipment.

Because of the high labor content in such work, American firms have been losing contracts to the foreign producer. Good example: The generating equipment purchased this spring by the Tennessee Valley Authority. A bid by an English firm was 50 per cent below that of General Electric Co.

To combat price competition in bids for foreign installations, some domestic firms have found it possible to work out combination deals with the government involved. Allis-Chalmers International did on a copper smelting plant project. It made arrangements with the French government (the installation was not in France) to provide the financing. Most of the manufacturing was to be done by a French firm. A-C International did the engineering, which was paid for in American dollars.

So A-C participated in a project which it probably would have lost otherwise. It also supplied some of the major equipment components to the French manufacturing firm.

Last month (May 18, p. 99), STEEL described industry's growing interest and participation in practical politics as a positive step toward improving the nation's business climate. Your ability to compete with foreign competition in both the domestic and world markets is affected substantially by government policy. The key areas are:

1. Tariffs

Tariffs and subsidies are repugnant to most metalworking executives. But several industries are being threatened, and many executives feel a tariff or quota system or some other sort of protection is a necessity.

The brass mill industry (through its Copper & Brass Research Association) made a detailed appraisal of the impact of imports on its products. CABRA figures show that domestic shipments of brass mill products have declined 33 per cent since 1955, while imports have increased 209 per cent. Imports of alloy seamless tubing in 1958 amounted to nearly 23 per cent of the domestic market.

CABRA suggests this approach:

- The U. S. should help foreign countries develop markets for their products in their own country or others where brass mill products are not made.
- Establish a flexible and changing

tariff system tied to foreign wage rates. As the foreign wage level increases and more nearly approaches that of domestic industry, the tariff would be reduced.

2. Investment Abroad

Laws to encourage industrial investment abroad are considered important by many executives.

Example: The Boggs Bill (H. R. 5) which is now before the House. It has these key provisions:

It would establish a new class of domestic corporation for foreign operations. Earnings would not be immediately taxable by the U. S., to permit expansion and further investment in overseas activities. Taxes would become due only when earnings are withdrawn from the foreign operation for distribution to stockholders or other use unrelated to the company's foreign operations.

3. Depreciation Reform

This is perhaps the most important broad area. Listen to A. F. Franz, president, Colorado Fuel & Iron Corp.:

"Foreign competition, in many respects, can attribute its remarkable growth to the rising costs in the U. S. We no longer have the superiority in facilities that for years permitted us to pay higher wages and still produce cheaper and better steel.

"In fact," continues Mr. Franz, "the smaller companies are in greater need of price relief than the larger ones because many of them have not had sufficient capital to modernize their plants fully.

"It is necessary for us to face foreign competition with improved equipment and lower operating costs. We cannot afford to price ourselves out of foreign and domestic markets if American jobs are to remain secure."

One of the major obstacles to depreciation reform by Congress: Industry people don't agree on what reforms are necessary. STEEL checked with tax experts and metalworking executives this spring to determine which approaches would best meet the needs of industry.

The editors narrowed them down to four basic approaches—they are outlined at left.

Conclusion

Foreign competition is sure to get stiffer—both at home and overseas. It'll take all the ingenuity you can muster to combat it. You must have new and better products. You have to market them skillfully. You may have to go overseas. You must step up the pace to cut costs and boost productivity.

One constructive step that you can take immediately is to write to Rep. Wilbur Mills, chairman, House Ways & Means Committee. Outline the method of depreciation that best meets your requirements. Demand that action be taken. You will have taken a major stride toward meeting foreign competition.

To get competitive with producers overseas . . .

You Can Take the First Step Today

HIGHER PRODUCTIVITY has been the chief advantage domestic metalworkers have enjoyed over their foreign competitors. But U. S. mechanization has come in spite of, not because of, our depreciation laws which are the most archaic among industrialized nations.

With steadily rising costs in every sphere, American industrialists may have to curtail (if they haven't already) the vital modernization made unfairly expensive by federal tax depreciation policies.

See for yourself how vital modernization is from this National Industrial Conference Board study of comparative U. S. and foreign production costs:

Where the average capital invested per production worker in the U. S. exceeds $20,000, the domestic plant had lower unit costs than the foreign plant in more than half the products. Where the U. S. investment is less than $10,000 per worker, the U. S. plant has higher unit costs than the foreign plant in six out of ten products.

Industry favors four different approaches to depreciation reform, as revealed by a STEEL survey, Mar. 2, p. 69.

1. The bracket plan would classify assets into 10 or 15 general categories as in the Canadian system. Brackets of maximum and minimum useful lives would be given. You would be allowed to choose any useful life within the bracket without challenge.

2. The MAPI plan, developed by Machinery & Allied Products Institute, would retain the present concept of useful lives but allow a triple declining balance writeoff, or alternatively, a large initial allowance sufficient to get a similar result.

3. The reinvestment plan provides that when a property is retired you can deduct the difference between its value in current dollars and its cost at the time it was acquired. That amount, added to what was already written off, will compensate for the decline in the value of the dollar. The deduction would be allowed only to the extent than an equivalent investment is made within two years of retirement. The amount written off in the first year would be deducted from the depreciable basis of the new property.

4. The inital writeoff plan for depeciation reform could be enacted by changing a few words in Section 179 of the Internal Revenue Code. The section, made law in 1958, allows a taxpayer to write off 20 per cent of the cost of depreciable property if the deduction is taken in the year of acquisition and the cost of the property does not exceed $10,000. The reform would remove the $10,000 ceiling.

Congressmen point out one big reason why reforms have not been enacted: Industry's has failed to tell them forcefully and effectively about the need for change. A strong expression of industry's desire for reform can come if you write to:

The Hon. Wilbur Mills
U. S. House of Representatives
Washington 25, D. C.

He's chairman of the tax-writing House Ways & Means Committee. Additional help would be your indication of the kind of reform you prefer. It would answer another Congressional complaint: "Industry doesn't know what it wants."

RUSSIAN TECH REPORTS—Yttrium seems to reduce the grain size of many cast metals and improve their strength, say Russian metallurgists. The same source also predicts that rapidly expanding Soviet electronics will call for greater quantities of 99.999 per cent pure metals.

SANDWICH AUTO BUMPERS—Stainless clad mild steel is proposed for automobile bumpers by Allegheny Ludlum Steel Corp., Pittsburgh. Two year field tests have failed to pit, peel, or corrode the cladding.

COLUMBIUM EXTRUSION BREAKTHROUGH—Small percentages of tungsten, aluminum, vanadium, or zirconium make it possible to hot extrude two columbium alloys developed by Haynes Stellite Co., a division of Union Carbide Corp., New York. The alloys oxidize much less rapidly than pure columbium. Strength: About 40,000 psi at 2400° F.

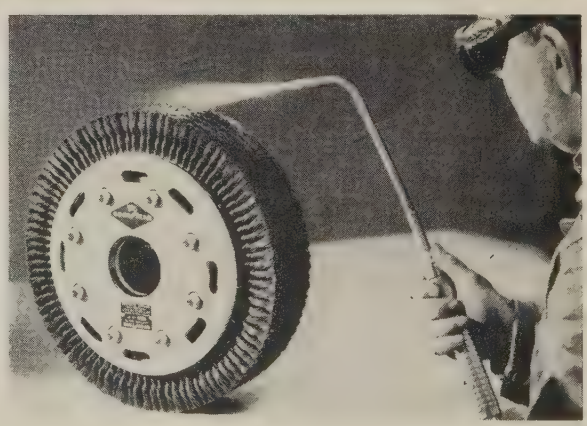
AUTOMATIC FLAW DETECTOR— Pipes and tubes get a fast going over with a new ultrasonic flaw detector developed by the Southwest Research Center, San Antonio, Tex. It does not require operator judgment to classify flaws. A proposed miniature version could inspect buried pipe for signs of corrosion.

SENSIBLE TEMPERATURE READING— Portable electronic thermometers called Thermophils are said to be accurate within 0.1° F at room temperatures. Atkins Technical Inc., Marion Bldg., Cleveland, explains temperature is related to changes in the electrical resistance of a germanium alloy in the tip of a probe.

STRENGTH THROUGH BUNDLING—Several thicknesses of paper-thin steel sheets wrapped tightly on a mandrel produce a cylinder with an ultimate tensile strength of 305,000 psi. Ryan Aeronautical Co., San Diego, Calif., finishes the cylinder with a series of spotwelds and a resistance weld through all layers. The technique is being proposed for rocket engine cases.

FLEXIBLE CAST IRON PIPE— Ductile cast iron is the basis for a formable cast iron pipe made by American Cast Iron Pipe Co., Birmingham. It is made into tubing, casings, fittings, and special castings for water, gas, and chemical mains.

TAPE REPLACES DIAL— Where panel space is at a premium, you might consider using a narrow tape indicator developed by the Franklin Institute, Philadelphia. The tape is servodriven, can be several feet long, and color-coded to indicate acceptable, marginal, or dangerous zones.

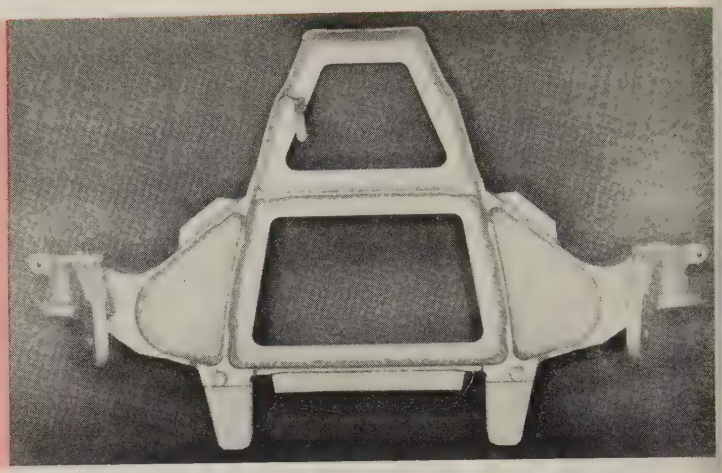


IT'S A SPACE TIRE, not a wire brush. Goodyear designed it because rubber can't take the 2000° F heat generated during space flights and landings. Load deflection is similar to that of pneumatic tires and rolling resistance is higher, an advantage in braking and slowing. The wheel is being tested at the NASA laboratories in Cleveland

HI-TEMP ELECTRICAL INSULATION— The surface of copper and aluminum wire can be reacted with fluorine to produce a superior kind of insulation which is effective at 1100° F. Coatings resist repeated 90 degree bends.

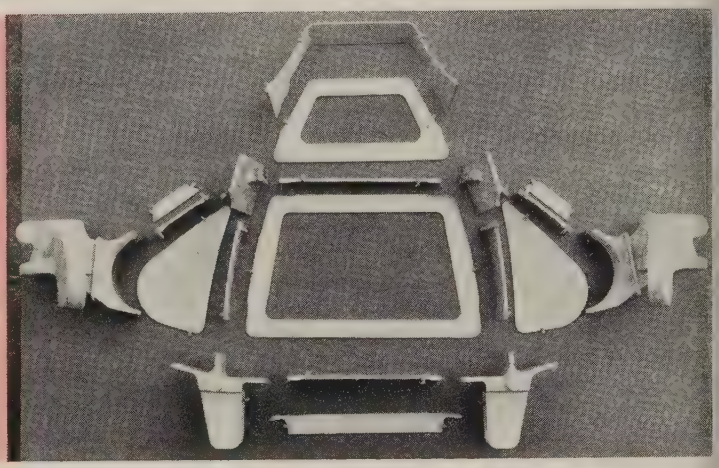
How Would You Make This Part?

This complex part posed a host of problems to its manufacturer. Should it be machined from the solid? Forged and then machined? How about fabricating it?



Here's How Rohr Did

Engineers at Rohr Aircraft Corp., Chula Vista, Calif., took this way out. Their process combines standard shapes, special forgings, and welding to produce the high-strength part at minimum cost



EVERY TIME a Boeing B-52G superjet bomber roars down the runway and hurls itself into the air, its eight mighty engines pull and strain against four 26 lb engine mounts.

The mounts, built at Rohr Aircraft Corp., Chula Vista, Calif., attest to the fact that the engineering choice between standard or special shaped materials can't be made by a toss of the coin, or by superficial estimate.

The Rohr design is the result of a variety of approaches tried by engineers and production men. It combines tailored forgings with sheets

Cost Crisis . . . How to Beat It

Shaped Raw Material Can Mean a Head Start

You may be able to trim the number of manufacturing steps or the number of parts used, or both. Also, a higher priced shape may actually result in lower material costs

AN uninterrupted climb in manufacturing costs is sending many production men back to the product designers. The purpose: See if some manufacturing operations, or some parts, can be eliminated—or at least simplified.

Special shapes are bailing some of them out. One manufacturer, for example, switched from bar stock to extruded tubing to make valve seat inserts. He cut both the machining time and material costs and saved an over-all 19 per cent.

A door closer cylinder used to be assembled from three parts. Now it is made in one piece as an extru-

and bar stock. High strength welds make the combination pay off.

• The first two ideas were discarded.

Since the part must combine the properties of high strength and minimum weight, only the metal that contributes to load carrying can be tolerated. To machine this part from solid stock would have been tremendously costly and time consuming.

The next logical approach would be to start with a forging, then machine away the extra metal. The approach was considered. Rohr engineers calculated it would take a 62 lb forging to produce the part, and they figured the forgings would cost them about $106 each, based on 400 parts.

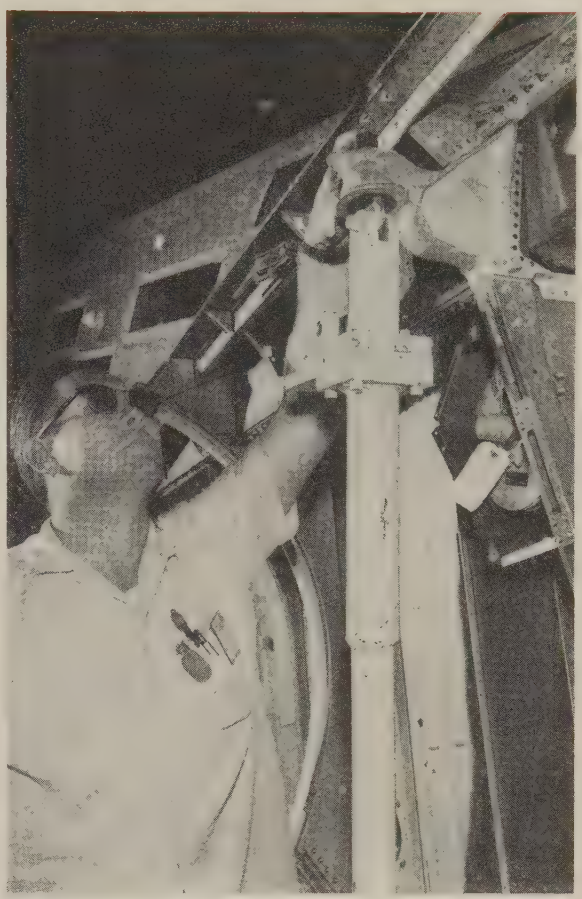
• The part was made from 20 components. The method is some 20 per cent cheaper than others considered, yet it provides all the necessary properties.

The engine mount is made from 4335 vanadium modified steel. The six forgings and 14 pieces prepared from standard sheet and bar stock are welded, using AWS 502 filler metal.

To get maximum weld properties, Rohr engineers specified butt-tension structural joints, moved away from the intersections far enough to allow welders to work efficiently. Forgings have protrusions along the line of intersecting members, so sound joints can be made.

The assembly was also designed so two members being joined are of comparable thickness. Shrinkage of the weld is also allowed for.

Some designers objected to weldments on the ground that welds were not strong enough. So Rohr's engineers beefed up the stock at the point of the welds, giving added strength with a nominal increase in weight.



Rohr's W. D. Gore checks one forged "ear" on an engine mount that's installed in the B-52G pod

After welding, the assemblies are heat treated to a minimum of 180,000 psi. Welds are examined by x-ray and must pass extremely tight requirements.

The net savings to the company is estimated at 20 per cent on each engine mount.

ion, eliminating several machining nd assembly operations.

A forged turbine ring costs Ford Motor Co., Detroit, only a fraction s much as those it machined.

The trend is toward materials o lessen machining and forming.

The problem of moving and re-oving large quantities has been ointed up dramatically in the air-raft and missile industries, where ew materials defy economical pro-uction. But the problem is not mited to the makers of spacecraft. t belongs to all metalworking.

Convair's Thomas E. Piper, executive staff assistant, says the goal is for parts that are "born to shape." The object is to get rid of the heavy roughing work on parts—leave only the relatively simple and inexpensive finishing.

• A word of warning: A decision you made two years ago on special shapes may be obsolete today.

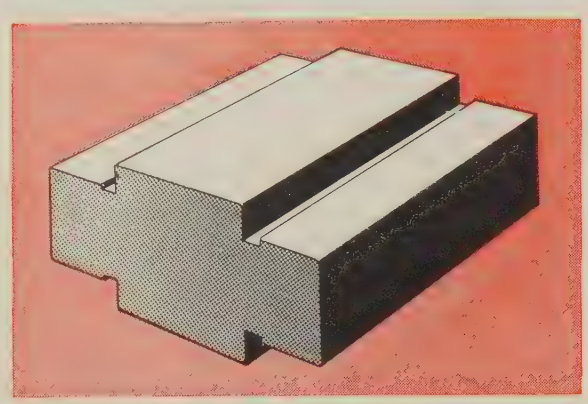
The technology of casting, forging, extrusion, powder metallurgy, rolling, and other processes has advanced enough to make re-evaluation advisable.

For instance, some production men still rule out castings for high strength parts, figuring they are good only for light to medium duty where tensile strength is important. Yet one of the country's leading foundries is turning out aircraft quality steel castings that have a 300,000 psi tensile strength, with up to 3 per cent elongation. That's good enough for most critical jobs.

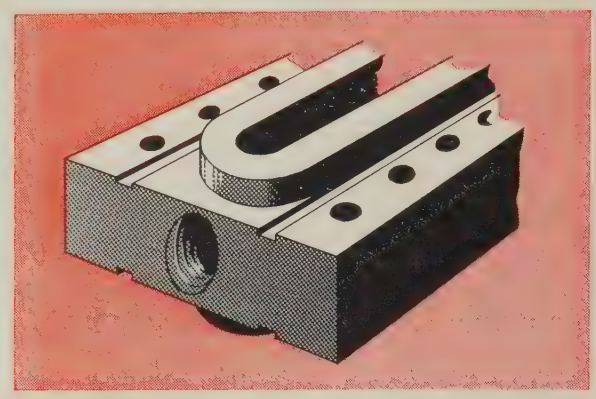
Another example: The general rule on steel extrusions is that no sections thinner than about 0.120 in. can be produced. Yet Convair has extruded sections as thin as 0.005 in. on its Dynapak machine.

• You may be able to reduce the

Cold Drawn Sections Trim Gage Costs



This sample section shows how cold drawing eliminated a straddle milling operation on each side



Finished parts are 7 in. to 10 ft long. Outside dimensions of the cross section are 2⅞ by 1½ in.

ENGINEERS at Penberthy Mfg. Co., Detroit, have trimmed 7 per cent off the cost of the liquid chamber on one of their high-pressure gages, despite an increase in material cost—from about $2.14 to nearly $2.90 for each part.

Behind the over-all saving is a special cold drawn section that replaces standard rectangular bar stock. The shaped stock eliminates the need for straddle milling both sides of the piece—an operation that used to take as long as 1 hour 20 minutes on long parts.

• **Redesign Helps**—Because there must be no radius at the base of the raised face, Penberthy redesigned the part to accommodate cold drawing.

It permitted the vender to undercut the intersection so no machining would be required to get the sharp corner.

Penberthy buys the sections in 10 to 12 ft mill lengths from Republic Steel's Union Drawn Steel Div., Massillon, Ohio, and cuts them to part lengths on a friction saw. Machining operations include drilling and tapping ½ in. pipe holes at both ends, milling the longitudinal slot, cutting a radius on the ends of the raised face, and grinding the top face for flatness. Bolt holes are drilled along each side.

number of production operations or the number of parts required.

In an analysis of shaped vs. standard raw materials, first consider the parts on which you have to spend a lot of time. One expert feels that any time you have to remove more metal than you leave, you have a good bet for shaped materials.

An aircraft production man cited five parts (STEEL, Nov. 24, 1958, p. 102) where an average of 95 per cent of the raw material for each part had to be removed as chips.

He said: "We not only can't tolerate the loss of production efficiency, but the material waste is prohibitive."

Production men at American Bosch Arma Corp., Springfield, Mass., did away with some of their machining time on split clamping rings for diesel fuel injection pumps (STEEL, Aug. 18, 1958, p. 112). They switched from standard round stock to a hot extruded, cold drawn section provided by Jones & Laughlin Steel Corp. The only machining left is to slice off a part, cut 15 gear teeth, drill a hole, and mill a slot. The machining reduction is estimated at 22 per cent.

A missile launcher component for the Convair F-102 supersonic jet fighter used to be made from seven machined parts that were welded together. The component became a shaft with fittings on each end.

Now the part is made from a piece of processed tubing that has been closed at each end, and the end fittings are forged from the tube stock. Result: The one piece component is lighter, costs far less, and all of Convair's assembly operations are eliminated.

The door closer cylinder mentioned earlier is an example of a shaped part that will trim both the number of manufacturing operations and the number of parts. It used to be made from a three piece end fitting that was threaded to a piece of tubing.

Now the cylinder will be made from an impact extrusion, furnished by Mueller Brass Co., Port Huron, Mich. Each part comes as one piece, complete with end fittings.

At Newell Mfg. Co., Lowell, Mich., where the extrusion will be used on one closer model, President R. W. Hook figures the company can crop about 10 per cent out of its manufacturing costs by eliminating machining and assembly operations.

• **Material cost may be lower when you use a tailored shape.**

Take the company that used to make automotive parts out of round bar stock. The parts wind up as rings, roughly 2 in. in diameter. A pound of solid bar stock produced two drilled and bored rings. But a pound of the tubing substituted for the bar will yield as many as five rings. Even though the price per pound of the tubing is higher, the price per part is lower than with the bar.

Over-all material savings are estimated at 16 per cent.

• **Part of your decision on standard vs. special shapes will be based on the number of similar parts you have to make—but the volume theory isn't always valid.**

Take the complex steel hook-shaped part that had to be made for a Navy jet fighter plane. Production men were faced with the choice of machining each part from the solid, or of buying a forging. Cost studies showed that the complex contouring and tracing jobs needed to render the part from the solid would eat up all the money saved by not investing in forging dies.

An analysis proved that a production run of only 15 parts would be cheaper to produce from forgings than from the solid and that allowed for the amortization of the tooling at nearly $250 per part.

Investment casting is known as an eliminator of machining operations which is practical even where the runs are limited. One manufacturer trimmed a machining labor cost of about $5 down to only 50 cents when he switched from bar stock to a lost-wax cast part. All he had to do to the casting was drill two holes, avoiding seven different machining steps.

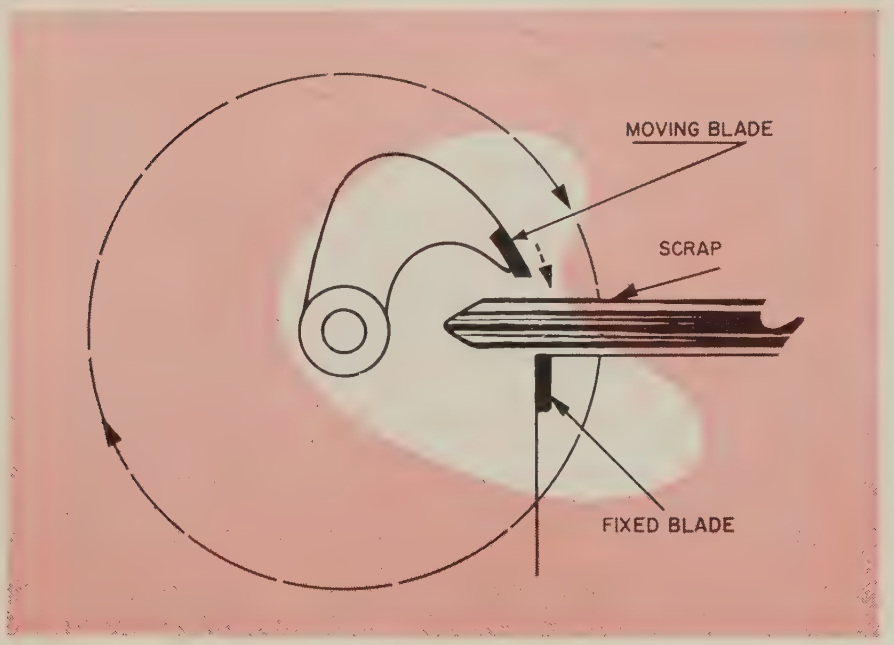
• **The design of a product is the greatest single influence on manufacturing costs.**

Design has to be a compromise between function of the end product and the cost for which you'd like to make it. The managers' best break is to get the lower cost with no sacrifice in function. Shaped parts may be an answer. In many cases you can buy the surface finish and dimensional tolerances you need on the finished part. Engineers at Allegheny Ludlum Steel Corp., Pittsburgh, claim hot extrusion tolerances of 0.031 in. for each inch of section thickness (up to 4 in.). They assert these can be halved by cold drawing.

Evaluation of alternate material shapes is part of the design job, and in many cases, cents spent here can crop dollars from the spiraling manufacturing costs.

Charge Material Upgraded By Rotary Scrap Shear

It makes a cut every 5 seconds; material isn't twisted, torn, or wedged, and there's no concentration of material at the blades. Cleaner scrap, cut in small pieces, is preferred as a charge material in steelmaking. Higher density makes for more efficient carloading



WANT to produce high grade scrap for premium prices and more efficient carloading?

Clean, uniform, high density scrap is turned out by a rotary shear at Houston Pressed Steel Corp., Houston, says Sidney Byer, president. The shear was supplied by the Canton Div., Hill Acme Co., Cleveland.

• **It's a high tonnage machine, but the product rivals that processed by smaller, hand fed shears.**

The 60 in. shear is less expensive to buy and maintain than other machines of the same capacity, its makers claim. (Cost: About $120,000.) Operated by two men, it turns out premium scrap at a low cost per ton.

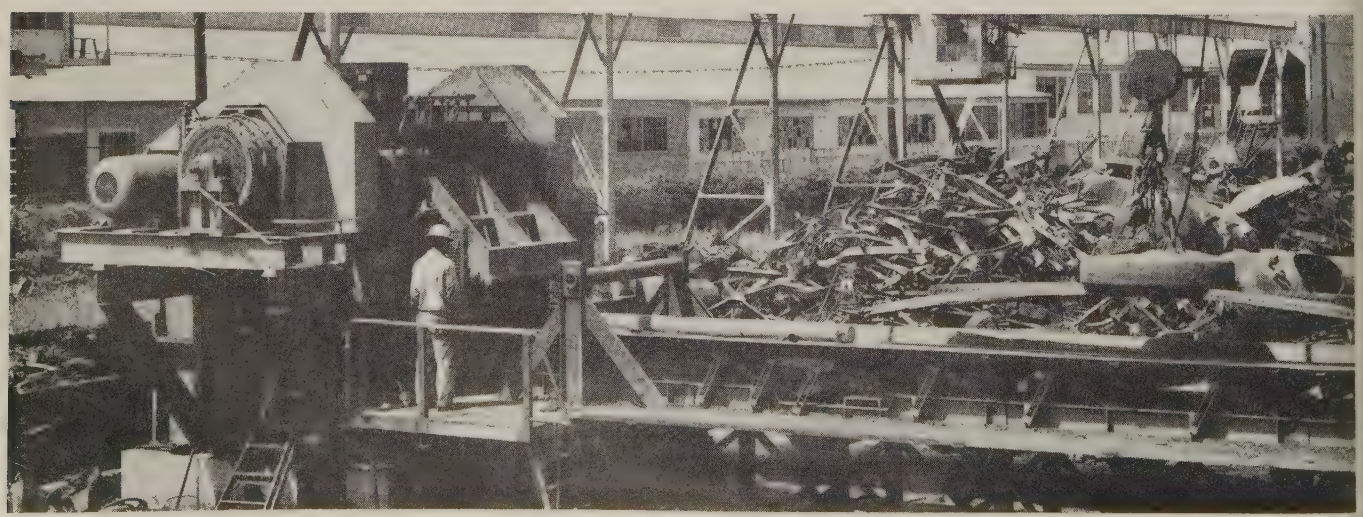
Long term operating figures aren't available, but the shear, fed by large cranes, is expected to cut more than 200 tons of scrap every 8 hours.

High speed cutting permits low scrap concentration at the blades, but the shear turns out high tonnage. It makes clean cuts, with no twisting, tearing, interlacing, or wedging of material. The product is similar to hand picked, hand fed scrap cut by smaller shears.

• **Scrap is cut by a heavy blade attached to a rotating drum.**

The stationary bottom knife is secured to the heavy steel base. The top knife is mounted on a cast steel drum, between two large gears. It can be installed with the drum stopped 180 degrees from closed position (the blade doesn't have to be held up while mounting bolts

Vibrating trough conveyor feeds scrap, no matter how long, into the rotary shear. Stationary hold-down keeps out any pieces too large for the knife opening



re tightened). Knives are available in one piece or in sections.

The drum makes a complete revolution every 5 seconds. Two heavy flywheels, mounted on opposite sides of the machine, insure proper balance for pinions and shafts.

Each flywheel is driven through a pneumatic clutch by a 50 hp electric motor. Clutches permit continuous or stop motion cutting. The drum can be stopped with an air brake.

When an overload occurs, clutches are released and motors are turned off automatically. The motors can be reversed to remove excess material.

The vibrating feeder conveyor permits easier separation of steel, nonferrous metals, and undesirable materials.

Scrap is fed into the shear by an open, vibrating trough conveyor. Material can be aligned and sorted before it's cut. That makes for better scrap and longer blade life.

Continuous cutting is recommended; the material moves better when the conveyor is full.

A stationary hold-down takes the shock when long pieces are cut and keeps scrap from entering the shear if it's too large for the knife opening. Safety is insured by hydraulically operated, automatic hold-down shoes. Cut scrap is completely enclosed in the shear bed, eliminating flying material.

The Houston company elevated the feed side of the shear about 8 ft and uses a steel belt conveyor to load cut scrap in cars on a depressed track. Other systems can be used. Example: A small, vibrating conveyor could be used for sorting and loading cut scrap.

Better Castable Offered

A tab-alumina castable refractory that takes up to 3500° F is announced by J. H. France Refractories Co., Snow Shoe, Pa. Called Hydrecon TabCast, it can be poured or cast after it's mixed with water.

The material has a crushing strength of 11,200 psi at 2500° F. It's said to show unusual resistance to corrosive furnace gases, extreme temperatures, and abrasion. Containing 93.66 per cent alumina and less than 0.1 per cent iron, it's useful in reducing atmospheres.

King-Size Machine Does Precision Work

Giant lathe handles parts 45 ft long and 105 in. in diameter, with a minimum of operator effort. It's controlled by push-buttons on the riding carriage

DOING precision work on large assemblies? You may get some ideas from the giant lathe used at Aerojet-General Inc., Azusa, Calif. It was built by R. K. LeBlond Machine Tool Co., Cincinnati.

Called the Admiral, it's a two-bed type. It's 54½ ft long, 120 in. wide, and weighs 75 tons.

• Designed to handle large, bulky assemblies, it will probably be used in making rockets.

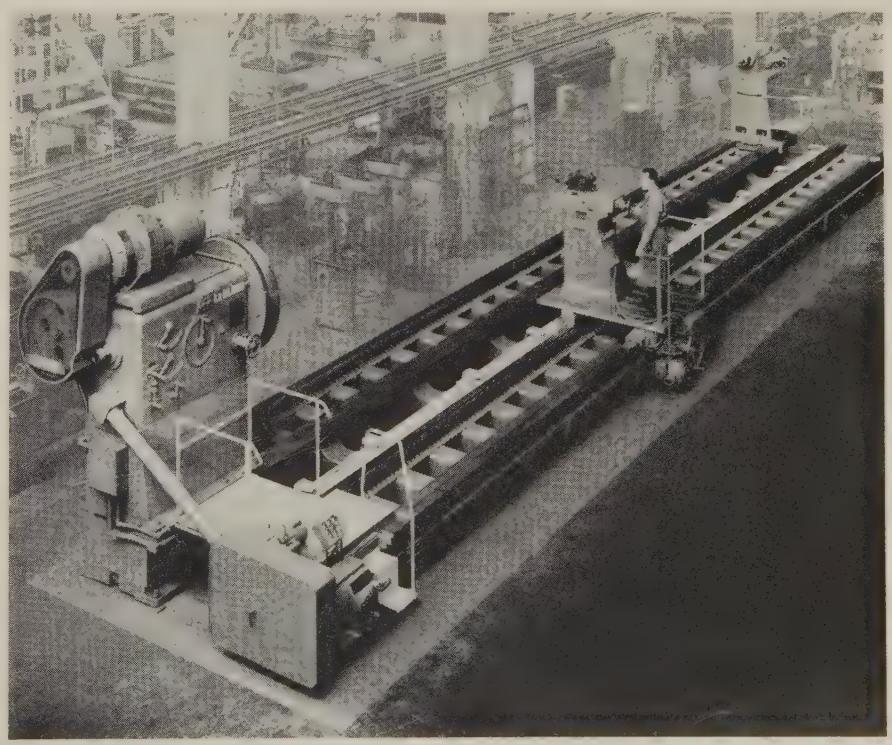
The lathe can be used for metal turning, but it will be used in other applications. (The company is prominent in the rocket field.)

It can handle a workpiece 45 ft long, with a diameter of 105 in. Spindle bearings can take a 50,000 lb load. Because many rocket parts are large but light, a 50 hp, variable speed motor is powerful enough to drive the lathe.

The machine has a full range of speeds (1 to 110 rpm) and feeds as low as 0.01 in. per revolution. The spindle is equipped with an electric brake for quick stops. Leads can be varied in microscopic steps.

• The lathe is operated with a minimum of physical effort.

Most of the controls, including remote ones for the headstock, are on the front of the carriage. The operator rides on the carriage, which runs on the front ways. Room for a second carriage is available for two-man operation.



Two-bed lathe is designed to handle large, bulky assemblies. It has a riding carriage and remote controls to reduce operator fatigue

New Insulation System Broadens Open Motor Use

Silicone rubber impregnated tape is three times stronger than unsupported silicone rubber. It shows good resistance to high moisture areas, as well as certain abrasive environments

Abrasion test results: General Electric's new supported silicone rubber motor insulation (right) shows less wear than other types. Number 80 grit was applied to each insulated coil for 20 minutes at 40 psi, 2 in. away from the surface

IF YOU use alternating current motors, take a look at the redesigned line made by General Electric Co., Schenectady, N. Y.

One feature, a new insulation system, means you can use less expensive, open motors where larger, totally enclosed types were required.

The supported silicone rubber insulating system is claimed to be 300 per cent stronger than unsupported types. Because of its high strength, the insulation can be thinner and dissipate heat faster. Voltage and thermal characteristics are outstanding. The insulation is rated Class B, but it has a Class F temperature capability and can operate successfully up to 482° F.

• The motors can be used in certain damp, corrosive, and abrasive atmospheres.

The insulation is effective against the effects of carbon black, flying chips and dirt, chemicals, fly ash, and moisture.

Form wound coils are given a consistent buildup of fiber supported insulation tapes. The entire coil is vulcanized to bond the tapes and provide a single, uniform dielectric wall around the coil. Bonding keeps out contaminants.

• Each layer of insulation (called Polyseal) contains Dacron and glass supporting fabrics.

Polyseal prevents cut-through and fracture of the silicone rubber. It also helps prevent rubber migration or flow. A special silicone rubber compound placed beneath the lead stops contaminants from entering the coil. When the coil is vulcanized, this compound seals the lead tubing to the silicone rubber coil coating.

Silicone rubber seals all connections and motor leads after the coils are inserted in the stator and the connections have been brazed. The completed stator undergoes a final baking which vulcanizes the silicone rubber on the connections to provide a completely sealed system.

• The new supported insulation has high abrasion resistance.

In a test using standard sandblast equipment, the material was essentially undamaged. Other commonly used insulations were cut through to the coil. Number 80 grit was applied for 20 minutes at 40 psi, 2 in. from the surface.

New completely equipped EF RESEARCH BUILDING

View of One Bay in the New Research Building
Showing the Continuous Strip and Bell Furnaces.

to develop and test improved heat treating techniques benefitting all metal producers and fabricators . . .

From the company's earliest beginning research has been traditional at The Electric Furnace Co.

Now, our facilities are much enlarged. The entirely new building is 80 ft. wide x 180 ft. long. Equipment includes a continuous strip furnace suited for processing at various cycles; bell, wire mesh belt, batch and pusher furnaces, with and without forced circulation; vacuum furnaces for batch or continuous operation; endothermic and exothermic generators; ammonia dissociators; atmosphere refrigerators; adsorption type gas dryers; CO_2 scrubbers, and completely equipped chemical and metallurgical laboratories.

From these new facilities will come improved techniques for treating familiar materials, and new techniques for treating the newer metals of the jet and space age;— also expanded testing of critical materials used in our furnaces, to maintain our unsurpassed standards of quality and performance.

As in the past, our research facilities will be available to metal producers and processors, for development and test work, conducted, if desired, in the presence, and with the assistance of your own technicians and production men.

This completely modern laboratory is as close to you as your telephone. Feel free to use it frequently!

EF

THE ELECTRIC FURNACE CO.

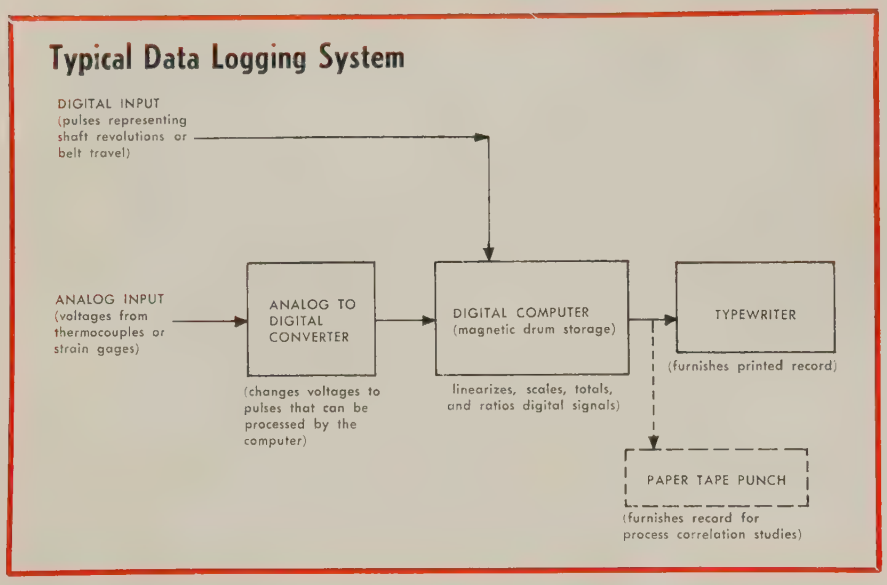
Gas-fired, Oil-fired and Electric Furnaces for Heat Treating any Product, Using any Process, any Hourly Output.

500 West Wilson Street *Salem - Ohio*

Branch Offices in Detroit, Mich., Santa Ana, Calif., and Cheshire, Conn. Canadian Associates, Canefco Limited, Toronto 13, Ontario

Steelmen Try Automation In the Sintering Process

Wanted: Higher tonnage and better quality sinter for blast furnace charge. Increased use of sinter is boosting blast furnace productivity and lowering the coke rate. Mix proportioning is the first step toward automation of the sintering process. Next: Data logging and process correlation studies



By J. E. ORAM
Industrial Engineering Section
General Electric Co.
Schenectady, N. Y.

LOOK for increased use of process control equipment in sinter plants.

Here's why: High grade ore reserves are dwindling. Low grade ores must be beneficiated and agglomerated for use in blast furnaces. Other benefits: Greater productivity and efficiency.

• Automation is often used in the raw material system feeding the sintering machine.

The proportioning system blends several types of ore with other raw materials to feed the sinter strand. Total flow depends on the desired burn-through point. If sinter bed burn-through is too early, flow of sinter mix is automatically increased; fuel, mill scale, cold fines, and other ingredients are automatically regulated, maintaining a preset ratio of the various materials to the ore input.

After the burn-through detector calls for a material flow increase and a predetermined transport time has elapsed, a bed level detector on the sinter machine senses the increase. Machine speed is automatically boosted to maintain the correct bed level. Higher speed moves the burn-through point nearer the end of the strand.

• More must be known about sintering before complete process control is possible.

Closed loop control, such as regulation of the burn-through point and bed level, is in limited use. Controlling metallurgical and chemical relationships must be better understood before the sintering process can be controlled automatically to produce sinter of predetermined quality.

Many variables are involved; a great amount of data must be recorded rapidly, in a form easily reduced, studied, and correlated. The answer: Data logging equipment.

• A typical system would collect process data and turn out a typewritten and punched tape record.

An installation slated for operation in 1960 is to record 64 points of data at 5, 15, 30, or 60 minute intervals. Analog inputs will represent such things as conveyor speed, temperatures, composition of raw materials, material weight and flow, drafts, speed, burn-through point, and bed level. The system can be expanded to handle additional signal inputs as necessary to gain complete understanding of the process.

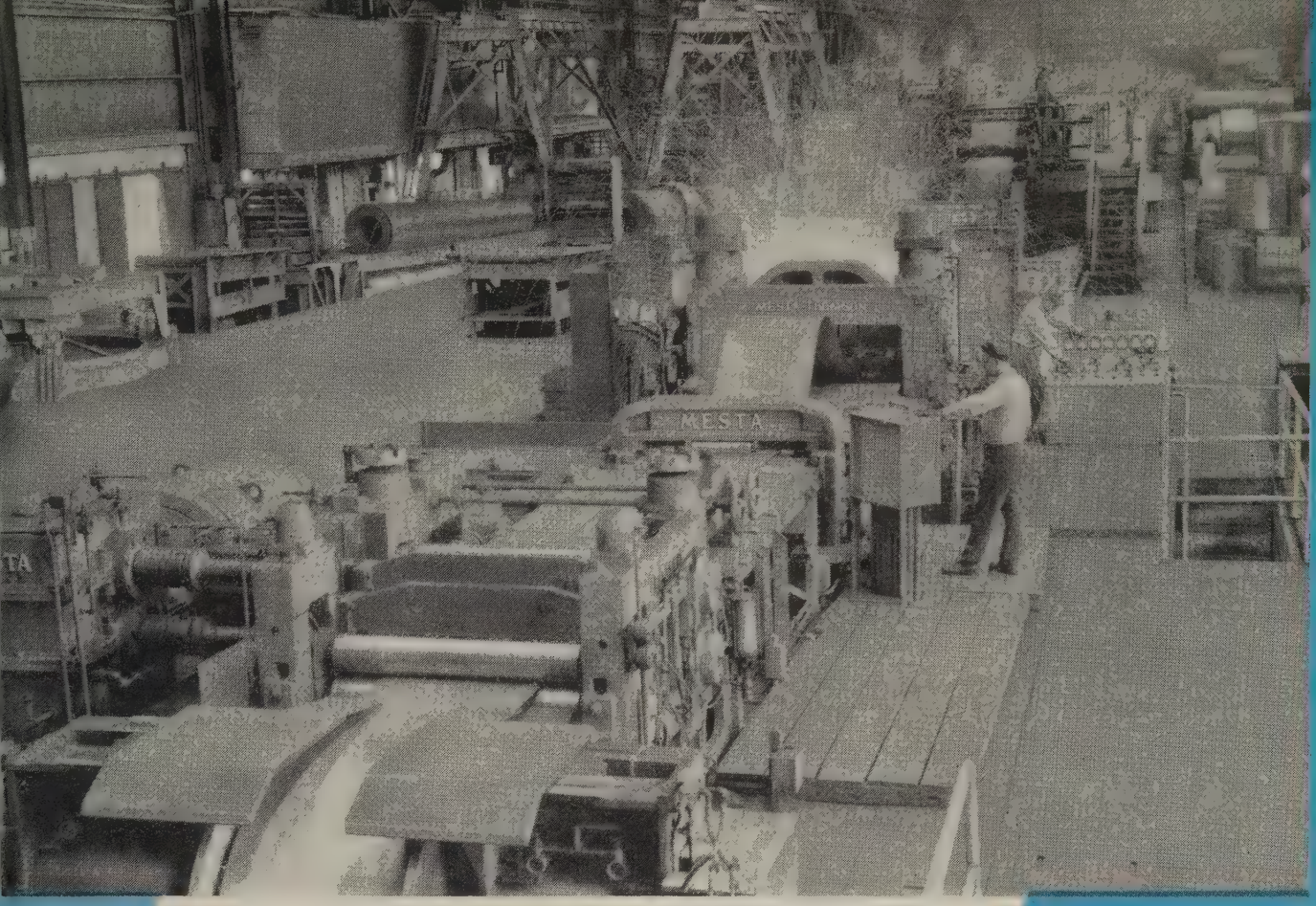
A digital computer, with magnetic drum storage, does all the linearizing, scaling, totalizing, and ratioing. Computer output is printed by an electric typewriter. Punched tape output, for process correlation studies, is also provided.

When selected inputs are outside preset high or low limits, an off normal alarm sounds, and the data logger scans all points, printing off normal readings in red type.

• The system will permit better record keeping in the sinter plant.

Production statistics will be totaled at the end of each shift. Example: Signals from the conveyor belt scales will go into temporary storage for integration and totaling every 8 hours, providing a production report. Optional: A multichannel trend recorder that could be connected to any combination of analog inputs.

As process information from the system is studied and correlated, it may be necessary to record more than 64 points of data. Modular design will allow analog and digital inputs to be increased as required, and as more process sensors become available.

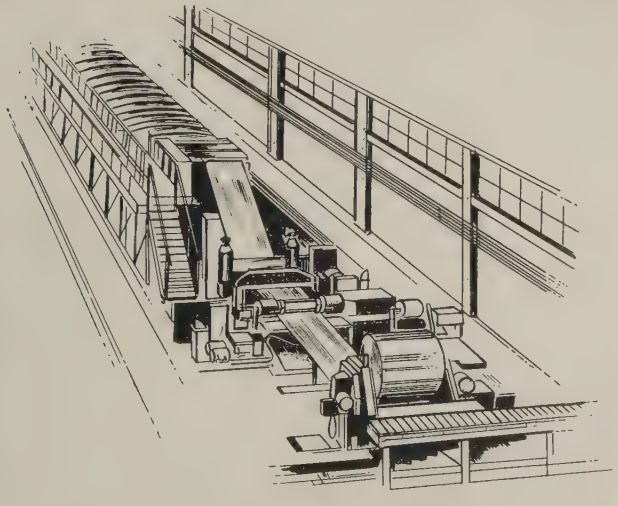


MESTA 48" Continuous Pickling Line with Primary and Secondary Processors, Flash Welder, Up-Cut Shears, Side Trimmer and Up-Coiler.

Continuous PICKLING LINES

DESIGNED AND BUILT BY

MESTA



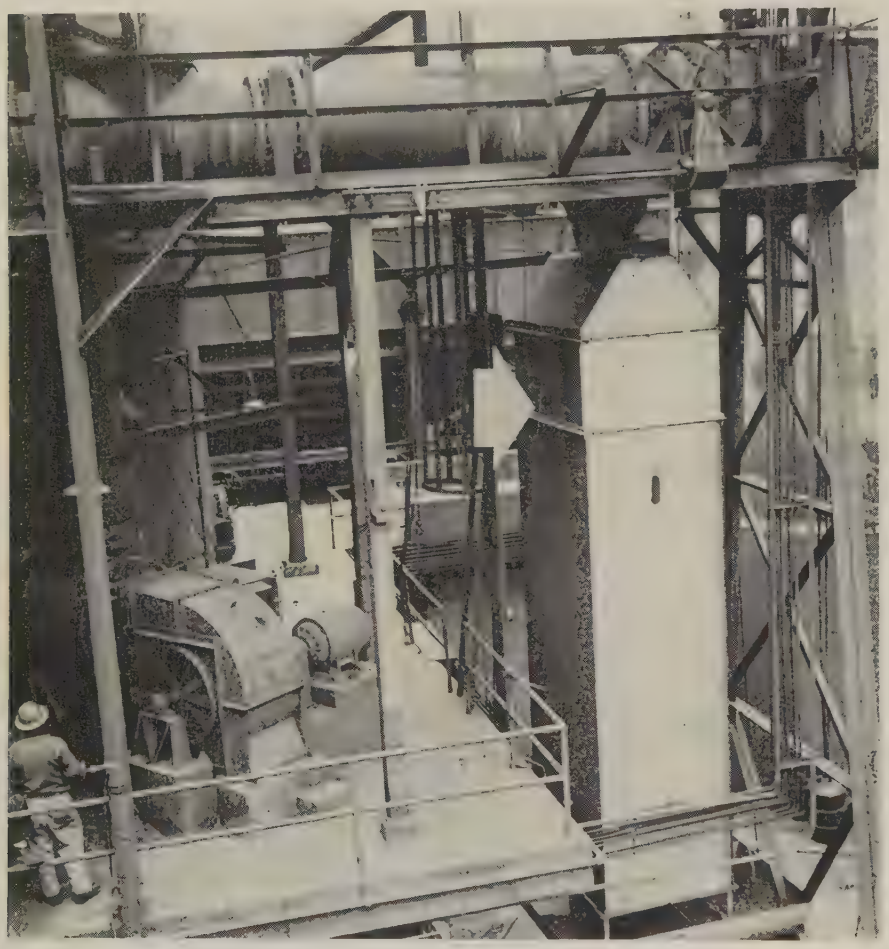
Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

Here's How to Muffle Blast Furnace Noise

Snort valve silencers installed at Kaiser Steel prevent hearing injuries to employees; they also improve plant efficiency and aid community relations



Silencer, suspended from the snort valve outlet, absorbs blast furnace roar

INDUSTRY is doing its best to silence objectionable noise. Example: Snort valve silencers muffle blast furnaces at Kaiser Steel Corp., Fontana, Calif. The units were supplied by the Sound Control Dept., Koppers Co., Inc., Baltimore.

• After testing one unit, the company decided to buy two more.

Kaiser considered noise suppression good business. Employees suffer hearing loss when they're exposed to high level noise over a long period. Plant efficiency and community relations are also affected.

The company installed a silencer on one furnace and tested it thoroughly.

When noise was reduced to an acceptable level, similar units were installed on two other stacks.

• Noise is absorbed by a mass of metal wool.

Each silencer, suspended from the snort valve outlet flange, weighs 8000 lb. The steel shell, 24 by 6 by 6 ft, is filled with spun metallic wool. A face sheet of glass fiber and a face plate of perforated, galvanized steel separate the metal wool from the shell.

Manganese Wrought Iron Resists Impacts When Cold

A new specialty wrought iron has been developed for use as an economical, impact resistant metal for low temperature design. It can outperform many steels, says A. M. Byers Co., Pittsburgh.

The material is intended for applications in the petroleum, chemical, and refrigeration industries and others in which brittle failure is giving trouble. Impact properties are good at subzero temperatures. The company says that excellent corrosion resistance, weldability, and working properties have been shown in laboratory tests.

The alloy is designated Mn wrought iron after its principal alloying element, manganese. It's a highly deoxidized wrought iron, with lowered phosphorus and carbon content, alloyed with about 1 per cent manganese.

Mn wrought iron pipe made by the company will be marked with a gold colored band 1 ft from each end. Plates and other flat rolled products will be similarly marked.

Permits Vacuum Pouring

A vacuum degassing system that permits top or bottom pouring of single steel ingots has been developed by Blaw-Knox Co., Pittsburgh. The assembly includes a 10 ton transfer ladle, a vacuum hood, a replaceable spout, and adapter flanges for 36 or 48 in. molds.

For top pouring, the ladle is set on the hood, which is then sealed to the top of the mold with an O-ring. For bottom pouring, a special plate seals the ring at the top of the hood.

Improves Ladle Additions

Ladle additions are made faster and more accurately with a new feeder system at National Works, McKeesport, Pa., National Tube Div., United States Steel Corp.

The system, designed by Blaw-Knox Co., Pittsburgh, makes additions in the tapping stream from a tilting, open hearth furnace. It uses electronic weighing and a 12 speed, vibrating conveyor to deliver up to 4500 lb of ferromanganese per minute.

Dollars Are Keys to Machine Selection

Showing off an estimated $4 million worth of new machine tools, a GE spokesman discusses some of the problems that go with determining a capital investment

WHEN a manufacturing man is planning new facilities or selecting new equipment, he must consider the financial justification of each plan or each choice. The job can't be left solely to the financial managers.

That's the opinion of W. W. Kuyper of GE's Large Steam Turbine-Generator Dept., Schenectady, N. Y. Speaking at a press conference last Thursday, Mr. Kuyper told how the justification was applied to buy new production equipment for his department.

Five specially built numerically controlled machines were introduced at the conference. They were part of a group of 19 new machines shown. All were installed in the last year. (See Page 92.)

• Evaluation of equipment must include a study of the income and the outgo.

Mr. Kuyper explained that: "Financial justification consists simply of forecasting the effects of a proposal on the cash flow and on the income account of the business." The income forecast should show the effects of savings made, offset by cost. It should also allow for any increased business that results from the investment.

The cash flow forecast shows, as a function of time, the amount at risk and the time that it is at risk.

Next step: To the financial forecast "we must add the assurance that we have chosen the right plan, and that we propose to buy the tools best suited to the job. It is often easy to justify a second best choice, but the adoption of anything but the best choice will eventually weaken the business. Further, the equipment which is procured must be the best for the job, not for some idealized circumstances that don't exist."

To illustrate, Mr. Kuyper checked off some of the justifications for special vertical boring mills. "A stub bar boring machine, with the tool rotating, proved on paper to be more productive, but considerably more costly . . . conventional medium or light duty machines without special attachments would have cost half as much, done half the work, and their lives would have been short in heavy duty operation . . . modification of the ram structure to permit more double tool cutting increased the output of the machine . . . so did the tracer attachment . . . the chip conveyor was costly, but it relieves the operator of a chore and saves machining time."

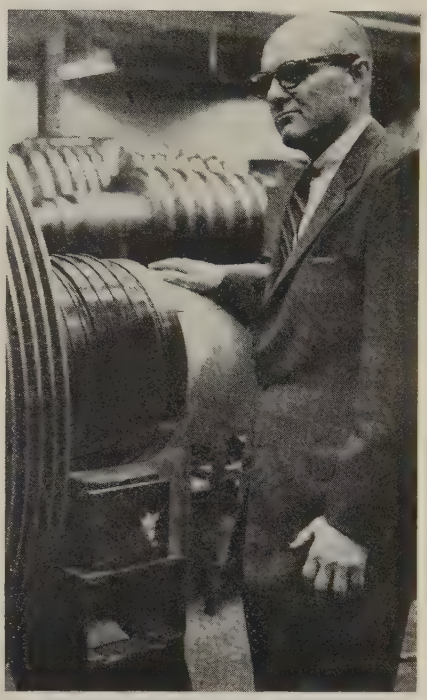
In machine evaluation, Mr. Kuyper says, all alternatives must be examined, and at the root of the examination must be the financial justification.

• Both depreciation allowances and tax rates still act as brakes on capital investment.

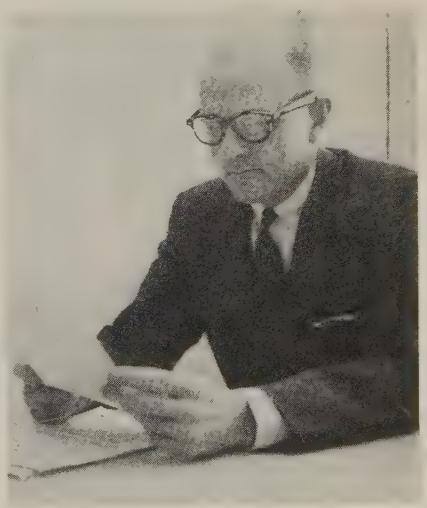
Mr. Kuyper says the war against unrealistic depreciation is about "half won." Revisions that permit greater depreciation in the early years have been a help.

A more serious deterrent to investment, laments Mr. Kuyper, is the high level of corporate income tax. Improvements in the tax rate he feels, would act as a greater stimulus to investment than would a change in depreciation rate.

As Mr. Kuyper sees it, depreciation and taxes don't hurt so far as domestic competition is concerned, since all companies are affected. But, he feels the investment deterrents put us at a disadvantage with foreign competition, and "we strain against the taxes which inhibit progress and which hurt us in the competition among nations."



GE's W. W. Kuyper: It's up to the manufacturing engineers to make financial justification part of their equipment selection plans



Says Mr. Kuyper: The limitations on depreciation rates and the high levels of corporate taxes are prime deterrents to equipment procurement

What are your tubing requirements?

Do you know that tubing can be formed into many unusual shapes? That it can cut the costs of many parts formerly machined from bar stock? That you can get it in many standard analyses or special ones with unique physical and mechanical properties? That no matter what the shape, the physical characteristics, the mechanical properties, the type of application—Superior can supply your needs? Superior is the world's largest producer of small-diameter tubing. More than 120 analyses are offered, including many types of stainless, carbon and alloy steels, nickel and nickel alloys, beryllium copper, titanium, zirconium and super alloys.

Typical of the scope of Superior tubing are those listed on facing page—carbon hydraulic tubing, stainless and carbon mechanical tubing, leaded steel tubing with excellent machining and forming characteristics, pressure and super pressure tubing, tool steel tubing, and many other types to fit most requirements. For assistance in the selection and application of Superior tubing, write for the name of your nearest Steel Service Center stocking this product and a copy of Bulletin 41. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

• SPECIAL SHAPES • COSTS • UNUSUAL PHYSICAL CHARACTERISTICS • UNIQUE MECHANICAL PROPERTIES

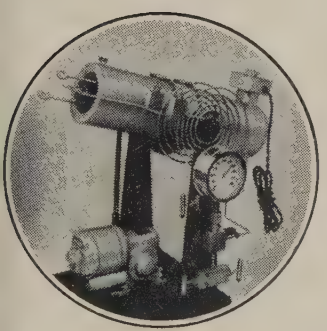
Carbon steel hydraulic tubing

FOR HYDRAULIC AND PNEUMATIC LINES:

Superior (SAE) Carbon Steel Hydraulic Tubing. Made from nonaging steel with high ductility properties in sizes from ⅛ in. through 1⅛ in. 100% hydrostatic pressure and flare tested. OD and ID surfaces are smooth, bright, uniform and protected with a special rust preventive. Recommended for pressures up to 3000 psi.

FOR HIGH PRESSURE APPLICATIONS:

Super Pressure Tubing. Single wall for pressures ranging from 15,000 to 30,000 psi. Available in ODs from .125 to .750 in. Made from Types 304, 316, 321 and 347 and in AISI Type 4130 alloy steel. Composite wall for pressures as high as 100,000 psi. Recommended combinations are low carbon steels and stainless steels, nickel base alloys and stainless steels.



Super pressure tubing

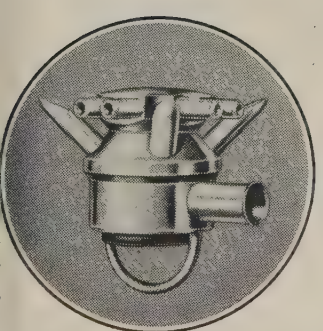
FOR MANY MECHANICAL APPLICATIONS:

Seamless Carbon Steel Tubing. 11 standard and 3 special grades for an endless number of applications. Stocked by Steel Service Centers in a broad range of sizes with diverse mechanical and physical properties.

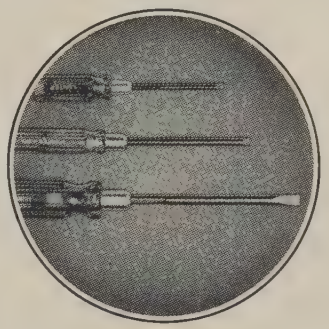
Seamless & WELDRAWN® Stainless Tubing. Type 303, for use where a free cutting material is required; offers high resistance to corrosion; assures good end-product surface. Also many other analyses.

Leaded Carbon Steel Tubing. Has built-in lubrication to permit faster speeds, heavier feeds. Will often reduce costs by requiring fewer finishing operations. Available in a range of ODs from .012 through 1⅛ in. in Leaded 1020.

Alloy Steel Tubing. In a number of different analyses. Designed for production of such parts as thread guides, races, gear and pinion parts, mandrels, etc.



Stainless steel tubing

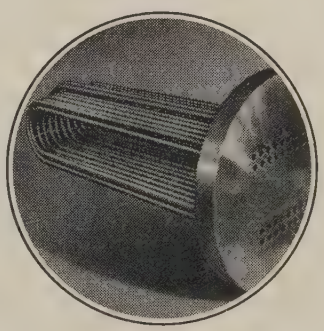


Tool steel tubing

Tool Steels. Produced from MT-1095 high-carbon steel and E-52100 alloy steel. Both grades have excellent strength, hardness and wear resistance. Both can be oil hardened to improve toughness and abrasion resistance. Available in sizes from .012 through ⅝ in. OD.

FOR HIGH TEMPERATURES REQUIRING HIGH STRENGTH, GOOD OXIDATION AND CORROSION RESISTANCE:

Super Alloy Tubing: Analyses include Types 316, A-286, 19-9DL, 16-25-6, Croloy 15-15N, Inconel X, Nichrome V, Hastelloy X, Hastelloy F, Waspalloy, Haynes 25 and N-155. Has a minimum stress rupture strength of 25,000 psi at 1000 hr. and 1200 F. Resists progressive scaling and other types of corrosion. Will not fail through brittle fracture or show excessive grain growth at operating temperature.



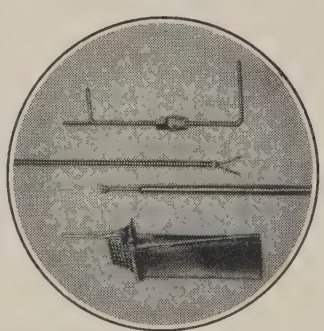
Heat exchanger tubing

FOR HEAT TRANSFER EQUIPMENT:

Heat Exchanger Tubing. Made from MT-1010, 502, 304, 304L, 316, 347, 348. Strict adherence to the highest commercial and military combined specifications. Quality controlled with uniform wall and extra close tolerances. Precise surface inspection. 100% flare and pressure tested. Excellent brazing and welding qualities.

FOR ELECTRICAL, ELECTRONIC AND SPECIAL APPLICATIONS REQUIRING GOOD CORROSION RESISTANCE:

Nickel Alloys: Analyses include Low Carbon Nickel, A Nickel, D Nickel, DURANickel, Monel, Inconel, Ni-Span C, Nionel, Nimonic, Hastelloy, Haynes 25, Permalloy, Chromel P, Alumel, Nichrome V and Invar. Many sizes, shapes and tempers. Excellent corrosion resistance, high strength and workability.



Thermocouple tubing

Superior Tube

The big name in small tubing

NORRISTOWN, PA.

All analyses .010 in. to ⅝ in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Company, Los Angeles, California • FIRST STEEL TUBE MILL IN THE WEST

Ford Revitalizes Quality With New Audit System

Audit team of engineers and technicians probes 15 cars daily at each Ford assembly plant. More than 1500 points are rechecked after cars leave assembly lines

WHEN you buy a Ford, your chances of getting a good one are a lot better than they used to be.

The reason is a new quality audit program that's paying its way, says John A. Fournier, chassis quality manager, Ford Motor Co., Dearborn, Mich., who described its benefits to those attending the annual quality control convention at Cleveland, May 25.

Savings in warranty expenses are footing the bill. Reports from the powerful, vocal dealer councils reflect the improvement, and letters from owners who say they're satisfied are on the increase.

• The quality staff first decided a change was needed to simplify communications with management.

Ford used to rely more heavily on in-plant or process inspection. Quality control men spotted at critical points in the assembly line checked samples during car construction (6000 or 7000 cars a day mean sampling 30 million parts).

To improve performance, Ford decided it needed a simpler, more effective way to express quality just as cost is measured in dollars and production in numbers. Complex graphs or half-answers weren't enough. It needed a system which could identify a weakness and tie it directly to the source. The method must permit management to regulate quality the same way it handles production and finance.

• The program depends on engineer audit teams who check finished cars after release for shipment.

At each assembly plant (there are 14), audit teams examine cars on the loading docks. Each team selects 15 cars at random each day, thoroughly checks some 1500 items, and reports the results to the plant quality control manager.

Separate forms are used for four inspection areas: Body visual, body sealing, chassis visual, and driving. Visual includes paint, glass, finish, trim, and window operation. Water booths pour on hundreds of gallons of water at high pressures to test door and window openings. Chassis checks are for mechanical structures like frame, transmission, engine, and steering. Driving and acceleration tests pick up performance details like engine, noise, brakes, and clutch operation.

• Point ratings reduce defects to numbers for easy comparison.

Minor imperfections are given a rating of 0.2 point; major conditions get up to 2 points. Total defects on one car fall into one of five predetermined categories which are easily described to management in daily reports.

Many automotive quality ratings are matters of opinion, says Mr. Fournier. So even the auditors are audited regularly by Dearborn staff people. If ratings given by the general auditors are the same as those being given locally, management feels reassured the program is operating properly.

As a final step, the quality staff measures the number and value of customers' requests for repairs. (It's called a dealer repair order analysis.) Although customers' opinions aren't questioned, they are weighted on the basis of motivation: A deviation must be pretty important to have made the customer give up his car for a few days. The repair order analysis becomes doubly significant when trouble trends match those of the staff auditors.

• A good quality program has four major features, Ford concludes.

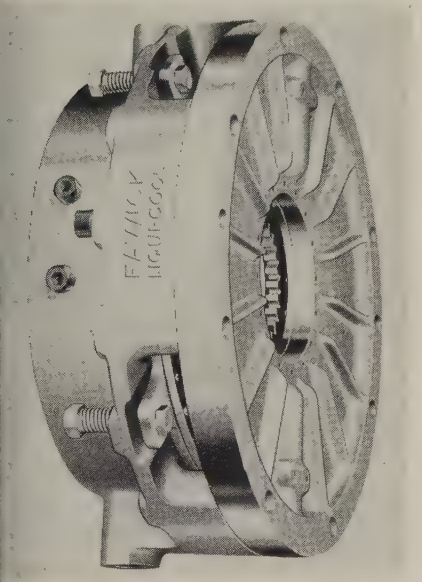
Successful product control involves: 1. Standards which are closely calibrated to what the customer thinks he wants. 2. Continuous measurement of performance against those standards. 3. Fast identification of a problem. 4. Assignment of responsibility for correction.

Clutch, Brake Unit Runs Longer, Cooler

Low comparative wear rate results from better heat removal from friction surfaces (up to ten times faster than conventional units). Cooloff time is eliminated

IF YOU need an industrial type clutch or brake unit for high inertia starting or stopping, consider the new liquid cooled units made by Fawick Airflex Div., Fawick Corp., Cleveland.

High heat dissipation (up to ten times greater than conventional units, says Fawick) makes it suitable for severe high friction use.



Copper pressure plates and liquid cooling end friction heat problems

The low wear units (disc type) provide precise tension control and excellent horsepower absorption for continuous slip clutching and braking. Possible applications: Ball mills, centrifuges, winding, and coiling.

Heat Transfer — Copper alloy pressure plates with spiral grooved backs (in direct contact with the coolant) assure good heat transfer. Copper's thermal conductivity is about eight times greater than the cast iron previously used. This eliminates heat buildup, warping or cracking of plates, cooloff periods, and excessive heat transfer to nearby components.

• **Other Features** — Fawick clutch and brake units can be actuated by hydraulic fluid, water, or even air. Main and auxiliary pistons operate over a larger pressure range than conventional units (0 to 75 psi). It is designed for low cooling water usage.

Five basic sizes of single and dual disc designs are being produced. Torque ratings for single disc units range from 4500 to 100,000 in.-lb. Dual disc units provide twice the capacity with the same diameter and mounting dimensions. Disc sizes range from 7¾ to 24 in. The internal gear drive features a straight-through bore for use on shafts from ¾ to 10 in. in diameter.

Fawick is manufacturing and marketing the unit under exclusive license (for industrial use) from Raybestos-Manhattan Inc., Passaic, N. J.

New Method Contours Stainless Steel Honeycomb

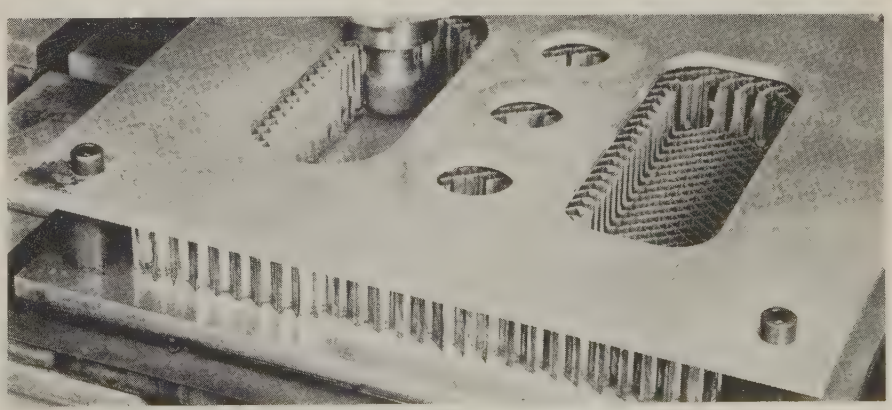
Using a modified electrolytic machining approach, it will generate nearly every shape that can be produced on solid materials. Close tolerances can be held

THE PERNICKETY job of cutting compound contours on honeycomb still is under attack.

The latest entry in the race for an economical solution is that of Ekstrom, Carlson & Co., Rockford, Ill. The process, a cautious modification of conventional electrolytic machining, can generate almost any shape, profile, or contour that can be machined on solid metal—and it does it with the soft touch required for fragile stainless honeycomb foil walls.

Long, narrow, oval, or round recesses apparently pose no production problems with the Eckstrom, Carlson method, and close tolerances can be held with little difficulty. Surfaces are burrfree, and there are no heat cracks.

Using a modified tracer, the machine can duplicate involute curves, diagonals and spiral cuts.



An overlay template governs the path of this end-mill type wheel as it routs and bores shaped cavities in honeycomb

Carbon Steels Combined, Cut Wear in Sliding Parts

Two carbon steels, a maximum hardness type and one having high hardness and stiffness properties, are being used together successfully for a sliding application in a textile machine component, a needle positioner for industrial sewing machines.

A needle bar, made from light tubing, moves up and down inside a tubular bearing. Originally, the tubular bearing (½ in. OD x 0.120 in. wall thickness) was made from C-1025 carbon steel. Excessive wear showed that a harder material was needed.

The inventor and maker, Edward Blankenship, Linden, Tenn., called on Superior Tube Co., Norristown, Pa., for help.

• **MT-109 and E-1095**—Acting on Superior's suggestion, Type MT-1095 carbon steel tubing was selected because it can be easily carburized to provide maximum hardness on the wearing surface. Strength is of no particular concern because the bearing is short and well supported.

The needle bar is longer. It requires hardness with enough stiffness to resist bending. Here, Type E-1095 tubing was selected because it can be heat treated to provide the required hardness. The OD is 0.285 in. and the wall thickness is 0.032 in.

Some of the components made with these steels have been in use for more than a year without showing signs of wear.

• **Another Problem Solved** — The needle positioner is adaptable to a wide variety of industrial sewing machines. It raises the needle automatically when sewing is stopped, and permits the work to be cleared without lost time or motion.

A steel plug (¾ in. long) is welded to one end of the needle bar and is then drilled to provide holes for the needle and screws.

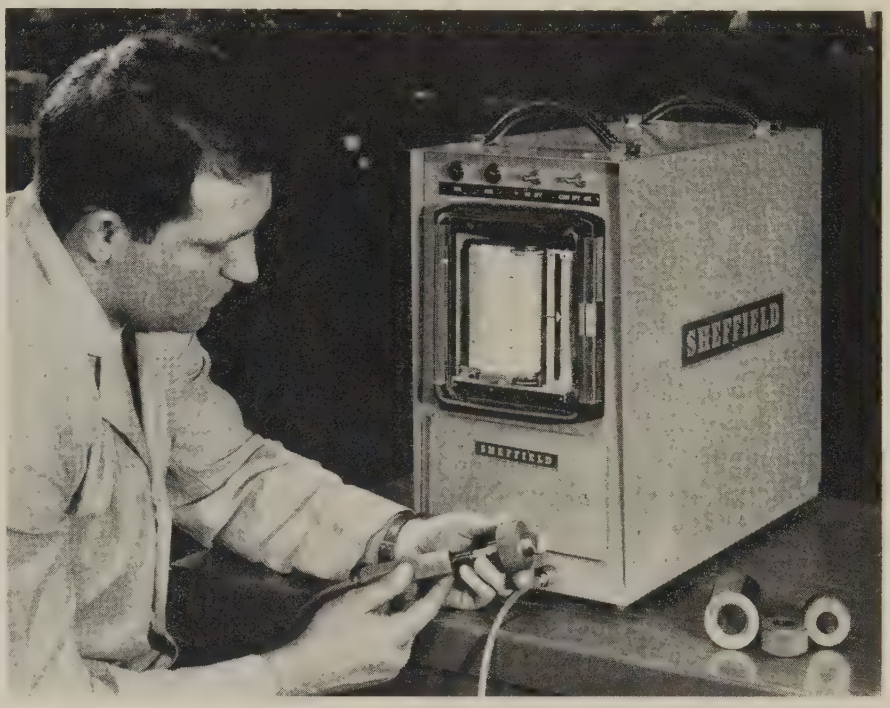
Initially, steel plugs from annealed bar stock developed hard spots after they were welded to the tube. They were almost impossible to machine. This was eliminated by a postwelding anneal at 1250 to 1300° F and slow cooling.

Instrument Air Gages and Records Simultaneously

DATA gathering for dimensional quality control charts or a charted record to serve as a size certificate can be made to machine accuracy with the Sheffield gaging and recording instrument.

The Air Gage Recorder, which uses hand or fixture-type air gage tooling, makes an automatic record showing a part's plus or minus deviation from nominal size on a 4 in. wide strip chart during gaging.

The standard model has a continuous chart drive and will inspect a single dimension. The instrument can be built to check two dimensions and can be equipped with optional features such as maximum and minimum signal lights, and an index drive to move the chart about $\frac{1}{8}$ in. on each gaging operation.



Back-pressure type air gage tooling is used as the size-sensing elements, including Open-Jet, Balljet, and Bladejet spindles, Air Snaps and Air Rings, and Plunjet gaging cartridges. Flow-type tooling up to 2000 to 1 amplification generally can be modified for use with the Sheffield Air Gage Recorder.

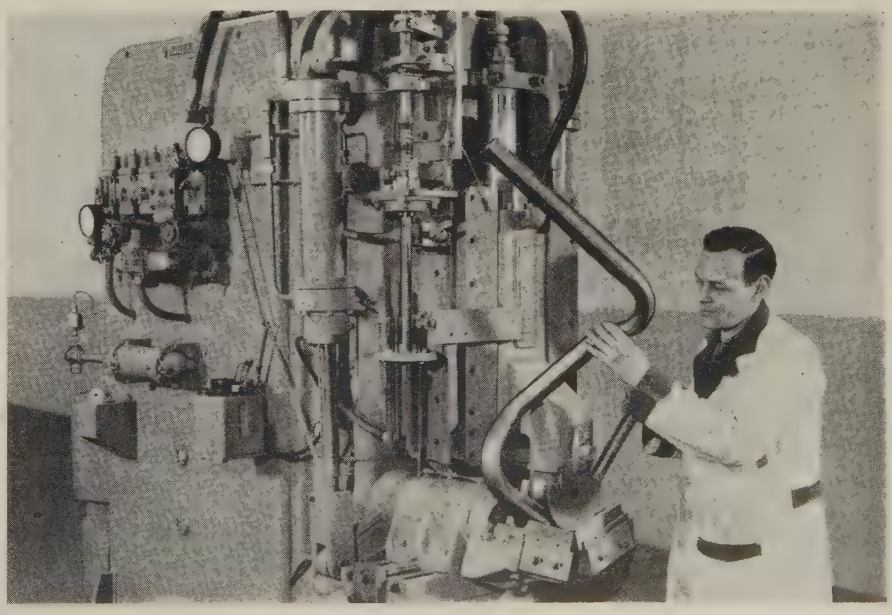
For more information, *write* Sheffield Corp., Dayton 1, Ohio.

Press Bends Odd-Shaped Workpieces Easily

OFFSET ram die construction of the Pines 20 ton bending press provides more working clearance around, above, and below the dies when bending odd-shaped workpieces. Automotive exhaust, tailpipe, and crossover tubes that require a number of bends in different planes are examples.

The offset ram die boosts output capacity and reduces tool cost since more work can be produced in a single setup.

A new ram cylinder deceleration circuit on the press assures more positive control of the ram at the end of the bending stroke, and improves accuracy. The heavy, ribbed, cast steel, C-type frame contributes to accuracy and provides the neces-



sary stability for handling large work on a long-run basis.

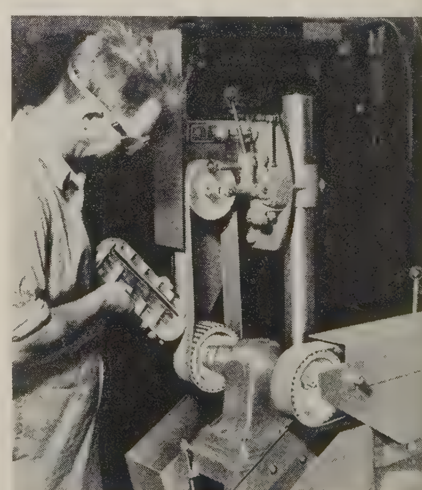
Variable speed control assures efficient, high speed operation to suit a wide range of work. A single screw adjustment sets both wing dies simultaneously which saves time and eliminates problems of equalizing die settings. A constant equalizing pressure is maintained throughout the bend cycle to prevent excessive distortion or wrinkling of the workpieces. Maximum capacity of the press is steel tubing with a 2 in. OD and 0.083 in. wall. For more information, *write* Pines Engineering Co. Inc., 601 Walnut St., Aurora, Ill.

Belt Grinders Permit Low Cost Job Setups

A LINE of $2\frac{1}{2}$ in. belt grinders fills the need for low-cost machines to do fast, efficient grinding, buffing, and deburring in metalworking shops, maintenance shops, toolrooms, and other industrial areas.

In addition to the four standard setups (single horizontal, double horizontal, horizontal and vertical, and double vertical), low-cost special job setups are possible with accessories. They include a vertical support unit, safety guards, dust and chip chute, fully adjustable platen, dust collector, and an adjustable tool rest for grinding.

A 4-in. backstand idler unit is also available. With this unit a polishing lathe using setup wheels or a bench grinder using grinding



WHY DID THIS BOLT FALL OFF?

Where is the culprit . . . the nut whose function was to keep the bolt securely in place? Undoubtedly it fell off earlier . . . loosened by vibration . . . or unexpectedly high shock loads due, perhaps, to a careless operator. In any event, the bolt was pounded into uselessness . . . and failed. Chances are that the equipment the bolt and nut were part of is temporarily useless too.

Why then, was an inadequate fastener applied in the first place? Perhaps because "bolts and nuts" are often overlooked or specified routinely. Perhaps to save a fraction of a cent. Whatever the reason, the end result was inefficient and uneconomical. The nut failed—the fastening failed—and the product failed.

It could have been prevented. An Elastic Stop® nut would have held on. The small extra cost of the *best* self-locking nut would have solved this case . . . saved repair bills . . . downtime . . . and a manufacturer's reputation.

For detailed photos showing how some of America's foremost manufacturers of heavy equipment have insured critical bolted connections with Elastic Stop nuts on such units as rock drills, scrapers, snow plows, off-the-road trucks . . . write to ESNA. Or, for first hand proof, tell us the preferred size and we'll send you test samples. Address: Dept. S35-660, Elastic Stop Nut Corporation of America, 2330 Vauxhall Road, Union, New Jersey.

DOUBLE DEPENDABILITY

The dependability built into every Elastic Stop nut builds itself into the dependability of every product on which it is used.

ELASTIC STOP NUT CORPORATION OF AMERICA

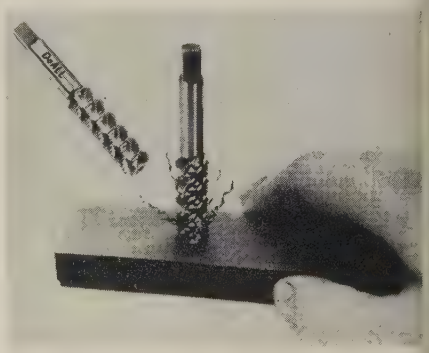
wheels can be converted for coated abrasive belt grinding and polishing.

For more information, *write* Dept. 1007, Walker-Turner Div., Rockwell Mfg. Co., 400 Lexington Ave., Pittsburgh 8, Pa.

Tap for Difficult Metals

YOU CAN GAIN tool life, greater accuracy, and accelerated chip removal with the Hy-Spiral Tap. Stringy and high temperature alloys such as stainless steels, boron steels, Monel, Hastelloy B, Inconel X, and ductile steels such as annealed SAE-1018, can be tapped to close tolerance.

The tap features a 52 degree spiral. This provides high shear at the cutting point and uninterrupted chip ejection. This feature coupled



with the 10 to 12 degree face hook and a 2 to 2½ thread chamfer provides smooth, accurate threads in even the most difficult to machine metals.

The free cutting action and positive control of chip flow makes the Hy-Spiral Tap especially suited to both aluminum and zinc diecastings which are difficult to tap blind in the vertical position.

For more information, *write* DoAll Co., Des Plaines, Ill.

Cleans Coolants of Chips

FERROUS solids are automatically removed from cutting oils and other soluble coolants with the compact Magnaflo Separator.

Self-cleaning, it eliminates the need for sump cleaning, changing of filter paper, bags or cartridges, and delivers nearly dry sludge for

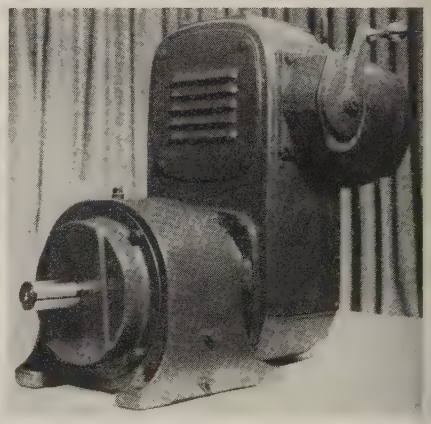
easy disposal. The unit operates without attention and it is virtually free of maintenance expense for the life of the equipment.

For more information, *write* Dept. LR, U. S. Hoffman Machinery Corp., Thompson Road Plant #1, Syracuse, N. Y.

Belts Changed Easily on Adjustable Speed Drives

EASE and simplicity of belt changing, smooth operation of the stepless control mechanism, and compact industrial appearance are featured in the Polydyne mechanical, adjustable speed drives.

The units operate on the principle of V-belt connected, adjustable pitch pulleys. The actuating force is directed through an equalizer which prevents any binding or sticking of the speed control function.



The drives are offered in ¼ to 25 hp in output speeds from 5 to more than 4000 rpm, with standard speed variations of 2, 3, 4, and 5 to 1.

For more information, *write* General Electric Co., Schenectady 5, N. Y.

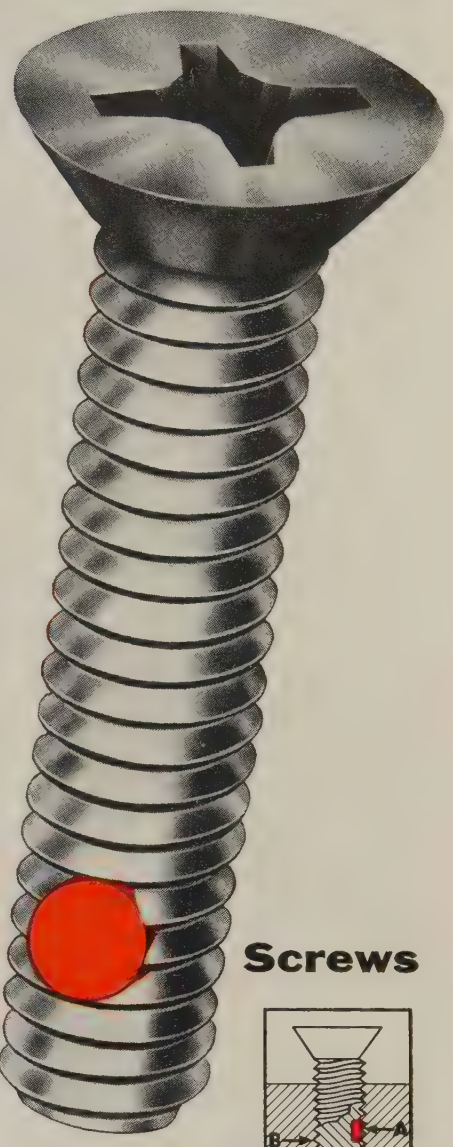
Universal Drillhead Has Cartridge Type Spindle

FAST, easy removal of spindles, bearings, and related parts are advantages of the cartridge type spindle plate construction available with Thriftmaster universal joint type adjustable drillheads.

The cartridge plate provides spin-

Continental has the cure for vibration "headaches"

the one-piece locking screw that won't work loose



IN MARKET CARTS — STAY TIGHT, RESIST SHOCKS OF SEVERE SERVICE

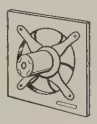
HOLTITE NYLOK hex head cap machine screw fastens chrome-plated steel tubing at right angles. Driven through holes, in one section into tapped steel plug in end of adjoining part. Hold securely despite punishment of customer use.

IN CARBURETORS — HOLD ADJUSTMENT OF ANTI-STALL CONTROL

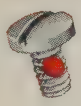
Hex head steel HOLTITE NYLOK machine screw maintains constant adjustment of anti-stall device attached to carburetors. Holds spring at required tension without variation through wide range of temperature changes.

IN EXHAUST FANS — HOLD MOTOR SECURELY DESPITE VIBRATION

Phillips truss head steel HOLTITE NYLOK machine screws are driven through rubber insulation mount into flange of vertical mounted motor. Screws do not loosen, resist constant vibration.



IN SHEARS AND SCISSORS — HOLD BLADES IN PROPER ADJUSTMENT



Binding head steel HOLTITE NYLOK machine screws are driven through drilled hole in one blade into tapped hole in mate. Hold proper blade contact, — permit easy disassembly for sharpening.

HOLTITE® NYLOK® Self-locking Screws

Resilient nylon plug (A) sets up a lateral thrust, smoothly wedges mating threads together (B). All locking action is on threads: head is not stressed. Locking is positive . . . seated or unseated.

One piece — no separate parts
Can be removed and replaced
Interchangeable — reusable
Locks seated or unseated
Acts as seal for gases, liquids

HOLTITE® NYLOK machine screws are the simplified self-locking fasteners with the Nylon insert that eliminates the need for lock washers, jam nuts, wiring and similar devices. If you have assemblies where screws *must stay* where they are set, NYLOK is your practical choice. The applications above show how you can save trouble and complaints, — give your product a sales advantage.

CHECK YOUR ASSEMBLIES — find out where Continental engineered fasteners, like HOLTITE NYLOK, can cut your assembly costs. Plan now to consult the Continental Assembly Specialists. They will analyze your operations and tell you which fasteners — *standard or special* — can save you most. For prompt service, write or phone: Continental Screw Co., 462 Mt. Pleasant St., New Bedford, Massachusetts.

CONTINENTAL

SCREW COMPANY, NEW BEDFORD, MASS.

HOLTITE FASTENERS

HY-PRO TOOL COMPANY . . . DIVISION
RESEARCH ENG. & MFG., INC. SUBSIDIARY

HOLTITE PHILLIPS AND SLOTTED HEAD
WOOD • MACHINE • TAPPING
THREAD FORMING •
SEMS • NYLOK
HY-PRO PHILLIPS INSERT BITS AND HOLDERS

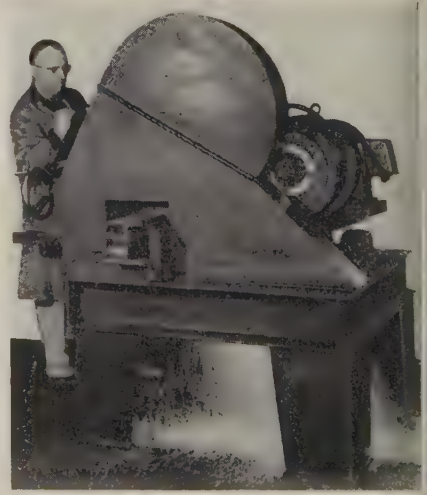
dle rigidity and accuracy usually found in fixed center heads while retaining the adjustable feature for application to various hole patterns. The cartridge containing spindle can be removed from the plate as a complete unit by taking out a single lock screw.

Cartridge type spindle plate construction can be furnished with any of the Thriftmaster standard, semi-standard, or special universal joint adjustable drillheads.

For more information, *write* Thriftmaster Products Corp., 1044A N. Plum St., Lancaster, Pa.

Swing Type Metal Saw Cuts Heavy Sections

USEFUL for both production and maintenance work, this all-purpose swing saw produces clean, high speed cuts on heavy structural members, bars, test sections, forging



blanks, extrusion blanks, high temperature alloys, die blanks, heavy cable, pipe, and many other materials.

The machine provides straight feed or oscillating feed at the option of the operator. When the operating button is pressed, the blade moves forward and backward, in and out of the cut, in line with the cutting plane. That reduces the arc of contact with the blade, increases blade life, increases the speed of cutting, and makes for generally burr-free abrasive sawing either wet or dry.

Other features include a powerful main motor (30 hp), sealed bearing spindle, timing belt drive, and a new dynamic suspension system that permits light fingertip feed without springs, counterweights, or adjustments.

For more information, *write* Ty-Sa-Man Machine Co., 1103 White Ave., Knoxville 1, Tenn.

Resistance Welding Alloy

AN ALLOY of copper and zirconium, Mallory 28 Metal, is recommended for applications where improved resistance to annealing or softening is required, and resistance welding applications where other alloys are prone to checking and cracking.

It is also recommended for spot and seam welding of aluminum and magnesium alloys, and steels having low melting point coatings, such as galvanized, aluminized, terne plate, tin plate, and cadmium plate.

The alloy has exceptionally high electrical and thermal conductivity coupled with high strength and hardness. The properties of the material are developed through a combination of cold working and heat treatment.

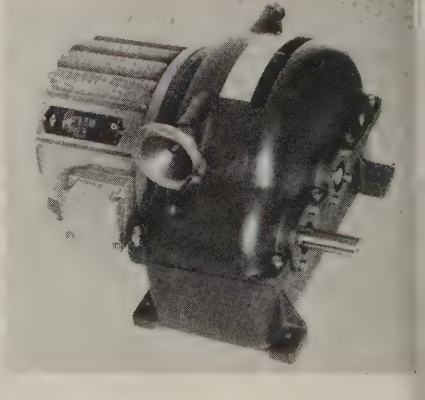
For more information, *write* Metallurgical Div., P. R. Mallory & Co. Inc., Indianapolis 6, Ind.

Variable Speed Drive Has Constant Horsepower

HERE is a variable speed drive, designed around a newly developed combination TV-Belt that provides a 3:1 ratio with basically constant horsepower. The driver of the TV-Belt is a timing belt pulley which gives constant feet-per-minute travel to the belt.

Speed is adjusted by a segment of a worm gear that is mounted to one of the idler-carrying side plates. It is actuated by a worm which is turned by the handwheel on the unit or which can be motorized.

While the transmission has a rated capacity of 1.5 horsepower with input speed of 1750 rpm and



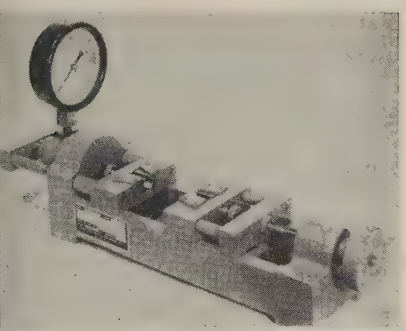
3:1 over-all ratio, increased over-ll ratios of 9:1 can be obtained by dding an auxiliary gearbox of 1:1 nd 3:1 ratios. The inputshaft of ne variable speed transmission can e operated through V-belts, tim-ng belts and pulleys, chain and prockets, or direct electric or hy-raulic motor drive.

For more information, *write* Western Mfg. Co., 3400 Scotten ve., Detroit 10, Mich.

Portable Tensile Testers Can Make Tests Anywhere

TENSILE tests on round or flat pecimens can be made anywhere ith a new family of portable ten-le testers. They can be carried asily; the net weight of each is nly 36 lb.

The testers do not depend on out-de power of any kind, since the oad is applied manually by rotat-ng a knurled knob. The applied oad is then measured by a trapped-il system.



They are available in capacities om 100 to 1000 lb with the ap-ied load indicated on a 4½ in. ameter gage.

For more information, *write* Steel ity Testing Machines Inc., 8817 yndon Ave., Detroit 38, Mich.

Machine Polishes and Grinds Flat Stock

THE ACME Model KP machine made with belt widths of 8, 10, 2, and 15 in.

All of the machines in the line ature pneumatic belt tension, belt acking, and micrometer grind essure adjustment. The V-belt ive for the abrasive belt permits lt speed adjustments. The con-

tact rolls can be easily changed and the pinch roll feed is infinitely variable.

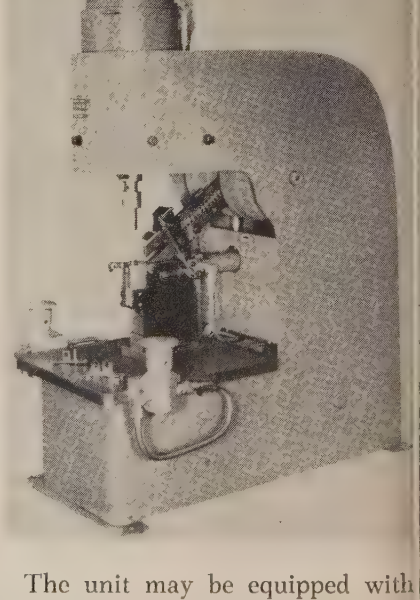
The machine can be equipped for wet or dry operations as well as oil spray or mist coolant systems.

For more information, *write* Acme Mfg. Co., 1400 E. Nine Mile Rd., Detroit 20, Mich.

Bench Type Driver Has Automatic Feeding

THE ADVANTAGES of automatic feeding of all production parts and the convenience of a bench type driver are combined in the Hoperal Driver. It will feed screws, nuts, bolts, rivets, nails, and other fastening devices.

The feeder provides a continuous supply of parts for the assembly operation without the disadvantages of overfeeding and back pressure. It selectively orients the parts in the inner track and feeds the parts to the outer track for use in the assembly operation.



The unit may be equipped with a solenoid, air, or hydraulic powered driver which is used to drive, peen, press, or stake the part being fed into the assembly. The automatic unit shown is equipped to feed and drive a brass stud into a small stamping.

For more information, *write* Haberstump-Harris Inc., 10463 Northlawn Ave., Detroit 4, Mich.

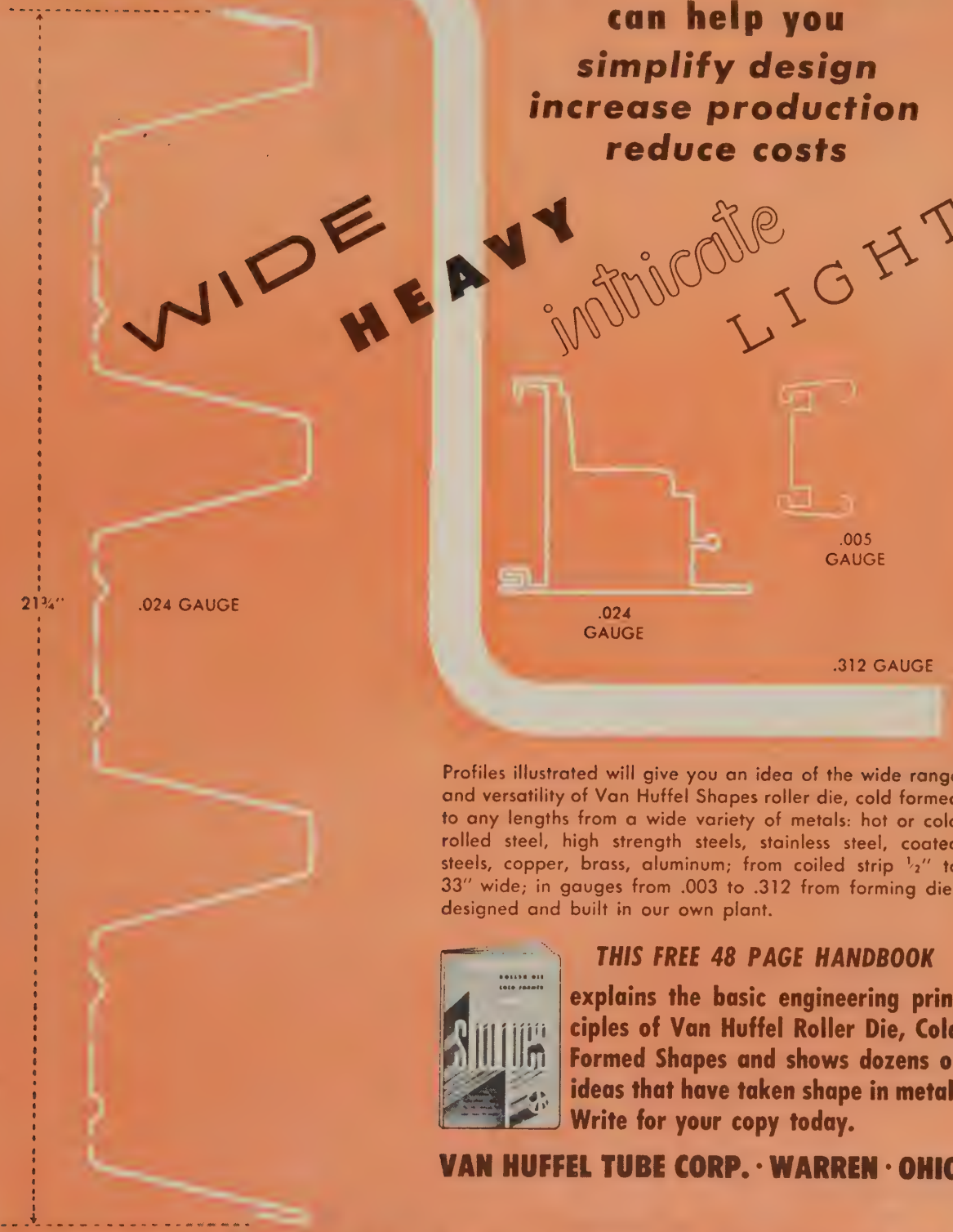
van huffel

ROLLER DIE COLD FORMED

metal shapes

can help you
simplify design
increase production
reduce costs

WIDE HEAVY intricate LIGHT



Profiles illustrated will give you an idea of the wide range and versatility of Van Huffel Shapes roller die, cold formed to any lengths from a wide variety of metals: hot or cold rolled steel, high strength steels, stainless steel, coated steels, copper, brass, aluminum; from coiled strip ½" to 33" wide; in gauges from .003 to .312 from forming dies designed and built in our own plant.

THIS FREE 48 PAGE HANDBOOK

explains the basic engineering principles of Van Huffel Roller Die, Cold Formed Shapes and shows dozens of ideas that have taken shape in metal. Write for your copy today.

VAN HUFFEL TUBE CORP. · WARREN · OHIO

where ideas take shape in metal

NEW literature

Write directly to the company for a copy

Aluminum-Bronze Dies

"Ampco for Forming and Drawing Dies," 8 pages, describes the advantages of aluminum-bronze forming and drawing dies. Ampco Metal Inc., 1745 S. 38th St., Milwaukee 46, Wis.

Index of Standards

The 1959 Price List and Index of American Standards lists more than 1800 standards. Dept. PR 66, American Standards Association, 70 E. 45th St., New York 17, N. Y.

Electronic Weighing

"Industrial Weighing Through Electronics," 12 pages, explains the development of electronic weighing, operation, economic considerations, and general data for instrumentation and remote recording. Streeter-Amet Co., Grayslake, Ill.

Lathe Catalog

The complete line of Delta industrial metal lathes is described in a 20-page catalog. Delta Power Tool Div., Rockwell Mfg. Co., 457 N. Lexington Ave., Pittsburgh 8, Pa.

Capacity Load Graphs

Pipe, I-beam, and channel load capacity graphs help to determine beam load or column load capacity of various sizes of materials. Tube-Strut Corp., 2960 Marsh St., Los Angeles 39, Calif.

Smelting-Refining Process

A booklet describes the Strategic-Udy process which can smelt economically simple iron ores and complex ores. It presents estimated capital and operating costs. Koppers Co. Inc., Pittsburgh, Pa.

Adjustable Speed Drives

A bulletin, No. GB-3, describes a complete line of adjustable speed drive equipment for industrial applications. Dynamatic Div., Eaton Mfg. Co., Kenosha, Wis.

Chain Data Bulletin

A chain sample book (Bulletin 59) illustrates most sizes of 17 types of welded and weldless chain. S. G. Taylor Chain Co. Inc., Hammond, Ind.

Insert Cutters for Boring

Report No. 576 tells how honing cost was reduced 60 per cent by modifying a tool cartridge to take a throwaway insert cutting tool. Kennametal Inc., Latrobe, Pa.

Waste Water Recovery

With proper treatment, waste water from metal finishing plants can be recovered and re-used. Two nomographs help you evaluate such treatments in terms of savings. Graver Water Conditioning Co., 216 W. 14th St., New York 11, N. Y.

June 15, 1959

Steelmakers Shipping at Record Rate

STEEL SHIPMENTS are continuing at a record rate as the July 1 strike deadline approaches.

Mills are pushing finished products out of their doors at capacity. If they can keep it up for the next two weeks, June shipments will match or exceed last month's record of 8.9 million tons.

A few weeks ago, market analysts were guessing that this month's shipments would fall back to the April level (8.6 million tons). Although current performance is better than expected, the odds still favor their prediction. Reasons:

1. Steelmakers will have to start banking their furnaces and trimming production schedules soon unless there's a turn for the better in labor contract negotiations.

2. Overworked equipment may have to be taken out of service for repairs or maintenance.

3. Slowdowns or wildcat strikes may hamstring production.

4. Shippers may be stymied by shortages of trucks or railroad cars.

SEMIFINISHED STOCKS FALL— With shipments running well ahead of production, steelmakers have nearly exhausted the stocks of semifinished material they accumulated in anticipation of strike hedging. Unless it suddenly becomes clear that there isn't going to be a walkout, mills won't start processing anything they can't finish before June 30. Sheet coils would rust if they were stored for an extended period.

DELAYS IN SHEETS, PLATES— Steelmakers in the Chicago area are about a month behind schedule on deliveries of sheets and plates. One company offered to ship plates from its eastern mills if customers would pay the freight differential, but it had few takers. Pittsburgh producers are only seven to ten days behind on sheets. In the East, it's believed that sheet carryovers will average two to three weeks by June 30.

JULY OUTLOOK BRIGHTENS— July bookings for sheets are moderately encouraging, but there's little doubt that some users are ordering only to assure themselves of fast service after a strike. Most eastern mills are booked through July on the popular grades. A Chicago steelmaker is fully committed for August. If a walkout is avoided, mills may be asked to postpone shipment of about 15 per cent of the July tonnage. Because flat-rolled steel is being consumed at a high rate, user inventories won't be big enough to eliminate the need for substantial shipments in the third quarter. Hot-rolled bar producers will operate close to capacity in July if they can start the month with a week's carryover from June and if all the new orders stay on the books.

GALVANIZERS RIDING HIGH— More galvanized sheets were shipped in April (328,759 tons) than in any previous month in history. Shipments in the first four months of the year were 1.2 million tons. If there's no slackening of the pace, 1959 shipments will be a record breaking 3.6 million. Best previous outturn was in 1956 (2.96 million). Producers are sold out for July, but some are still taking orders for August. Capacity operations are expected throughout 1959.

PRODUCTION HOLDS— Last week's production was unchanged from the previous week's 2,661,000 ingot tons. Steelmakers continued to operate their furnaces at 94 per cent of capacity.

WHERE TO FIND MARKETS & PRICES

	News	Prices
Bars, Merchant	185	193
Reinforcing	185	194
Boiler Tubes	...	*
Canada	...	199
Clad Steel	...	197
Coke	...	199
Coal Chemicals	...	199
Charts:		
Finished Steel	...	191
Ingot Rate	190	...
Scrap Prices	...	203
Comparisons	...	191
Contracts Placed	203	...
Contracts Pend.	203	...
Electrodes	...	*
Fasteners	...	196
Ferroalloys	...	200
Fluorspar	184	199
Footnotes	...	196
Imported Steel	183	199
Ingot Rates	190	...
Metal Powder	...	199
Nonferrous Met.	206	208
Ores	190	199
Pig Iron	189	198
Piling	...	193
Plates	189	193
Plating Material	...	209
Prestressed Strand	...	196
Price Indexes	...	191
Producers' Key	194	...
R.R. Materials	203	196
Refractories	...	199
Scrap	202	204
Semifinished	189	193
Service Centers	189	198
Sheets	184	194
Shipments	190	...
Silicon Steel	...	195
Stainless Steel	185	197
Steel Containers	190	...
Strip	184	195
Structurals	187	193
Tin Mill Prod.	186	195
Tool Steel	187	197
Tubular Goods	186	197
Wire	...	195

*Current prices were published in the June 8 issue and will appear in subsequent issues.

Metalworking Outlook—Page 79 Technical Outlook—Page 141

TREADWELL COOLING BED

built in tandem, each over 100 ft. long. Each bed will cool 125 tons of 4" x 4" steel per hour.

For heavy duty and efficient production, this steel company called on Treadwell Engineers. The result are these Treadwell Cooling Beds efficiently operating day in and day out. If you have a machinery problem, call on Treadwell Engineers.

Pictured above: Treadwell Cooling Beds at work in an eastern steel mill.

TREADWELL
ENGINEERING COMPANY • EASTON, PA.

SALES AND ENGINEERING OFFICES:

208 S. LA SALLE STREET
CHICAGO 4, ILL.
CEntral 6-9784

140 CEDAR STREET
NEW YORK 6, N. Y.
WOrth 4-3344

1015 FARMERS BANK BLDG.
PITTSBURGH 22, PA.
ATlantic 1-2883

Manipulators, Mill, etc.
Mills, Billet, Merchant & Bar
Mills, Rod
Special Machinery
Coilers & Reels

Conveyors, Coil
Drives & Pinions
Ejectors, Furnace
Gauges, Shear, Saw, etc.
Beds, Cooling

Mills, Vertical Edging
Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers

Beds, Inspection
Bumpers, Furnace
Pushers, Furnace
Repeaters
Handling Equipment (Kick-offs, Pilers, Cradles, etc.)

CASTINGS—Electric Furnace Steel, Ductile Iron, Gray Iron and Ni-Hard

Lake Ports Get More Foreign Steel

Great Lakes Ports of Entry

(Week ended May 30, net tons)

Products & Sources	Chicago	Cleveland	Detroit
PIPE from:			
France	139.0	8.0	....
STRUCTURAL ITEMS from:			
France	218.0	....	81.3
Italy	6.5	....	....
Belgium	3,915.89	71.33	57.5
Germany	126.0	....	....
STEEL BARS from:			
France	1,099.0	99.99	....
Norway	2,182.0	....	....
Germany	3,860.0	....	....
Belgium	1,272.9	217.87	44.9
England	....	10.90	258.0
Sweden	....	10.91	7.0
STEEL WIRE from:			
France	23.0	549.5	....
Germany	20.9	....	20.9
Belgium	27.17	....	....
England	....	26.67	....
WIRE RODS from:			
England	1,122.0	....	....
Belgium	1,098.79	....	....
Germany	930.0	....	....
NAILS & STAPLES from:			
England	13.0	....	....
Germany	2.57	....	....
BOLTS, NUTS, ETC. from:			
England	7.54	10.05	....
Holland	15.0	....	43.0
Germany	60.58	....	1.5
Sweden	....	42.69	....
Italy	....	....	18.0
Belgium	....	....	44.5
France	114.51	....	....
STEEL PLATES from:			
Belgium	1,039.06	....	....
France	....	....	17.5
GALVANIZED WIRE from:			
Belgium	170.0	....	....
Germany	10.5	....	....
SHEETS from:			
Germany	....	....	536.4
GALVANIZED SHEETS from:			
France	....	....	441.6
STEEL RAILS from:			
Belgium	92.8	....	....
BARBED WIRE from:			
Germany	....	....	41.5
ALL OTHER STEEL PRODUCTS	2,747.07	7.45	....
TOTALS	20,313.78	1,055.36	1,613.60

FOREIGN steel is entering Great Lakes ports via the St. Lawrence Seaway in little more than a trickle, but steelmen, particularly the operators of service centers, fear the trickle may become a flood before long.

They say that given the right set of market conditions and the elimination of some present disadvantages of ocean shipping (traffic congestion at the Seaway and Welland Canal and inadequate port facilities), import volume is bound to rise, especially after domestic consumers become familiar with trading procedure and customs red tape.

Since the opening of the Seaway several weeks ago, steel imports have increased appreciably over those of recent years. They were noticeably heavy during May but have tapered off some this month. But if there's a steel strike next month, it's believed foreign steel will get a play from many supply-pinched manufacturers who hadn't considered imports in their procurement plans.

• **Prices Are Attractive**—A survey of ocean freight rates shows that most European steel products can be shipped to Great Lakes ports at the same prices as to North Atlantic ports (see Page 199). Because of lower labor costs, European steelmakers can undersell U. S. producers by as much as $40 a ton anytime they choose. Not only are their base prices lower, but their extras do not run as high as those charged by U. S. companies.

Prices of imported steel have tended to rise at coastal ports in recent weeks, and the trend is expected to continue so long as demand expands. However, British prices were cut $2.80 a ton (about 2 per cent) June 1 on shipments of 10 tons or more. It is a long term measure, aimed at inducing buyers to increase the size of their orders.

• **Ports of Entry**—European steel is entering ports all along the Great Lakes route, but the bulk of it is going to Chicago, Cleveland, Detroit, Buffalo, and Milwaukee. Chicago appears to be the favorite port of entry. Most of the tonnages are

small, and the product mix, though broad, largely runs to wire items and reinforcing steel (see table). Shipments of heavy structurals, plates and sheets have been limited.

Generally, foreign steel is ordered through established importing houses, chiefly in New York. But there is also some direct dealing with foreign steelmakers. Importers largely do business by long distance telephone, though in some cases they have established sales agencies in Great Lakes ports.

Domestic distributors are disturbed by rumored plans of foreign steelmakers to establish mill depots at strategic spots in the Great Lakes region. They would duplicate service at some Gulf of Mexico ports. The depots would carry standard sizes, largely overcoming some of the disadvantages attending the winter freezeup of the Seaway and the lakes.

All the foreign steel coming into the Great Lakes area appears to be from Western Europe. The major country of origin seems to be West Germany, but Belgium, France, and Britain are sending substantial tonnages.

Mexican Fluorspar Cargo Moved via the Seaway

Bethlehem Steel Co.'s Lackawanna plant has received its first cargo via the St. Lawrence Seaway—4242 tons of fluorspar shipped from Tampico, Mexico. Another fluorspar cargo is scheduled to arrive within a few weeks.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 194 & 195

Most of the sheet mills are booked up through July on the major grades. But what will happen next month hinges on whether there's a steel strike. If a strike is called, production will drop sharply; if a peaceful settlement is reached, output will be fairly well sustained.

Current consumption is running ahead of expectations. So inventories will not be as heavy as consumers had planned. The situation will modify requests for deferments and cancellations if a strike is averted. However, it's thought that if a strike's avoided, consumers may ask to postpone shipment of 5 to 15 per cent of the steel they've ordered for July delivery.

One Pittsburgh district sheetmaker is only a week behind schedule on deliveries of hot rolled and cold rolled sheets. Its orders for July are "pretty decent," but there's little doubt that some users are ordering only to assure themselves of fast service after a strike.

It's thought there may be a final spurt in business at the end of this month if consumers abandon hope of a peaceful settlement of the steel labor talks. August tonnage is coming in at a normal rate. There's no pressure because users have until the end of this month to order.

Galvanized sheets are sold out for June and July, but orders are still being taken for August. Producers expect capacity operations until the end of the year. Some look for record output.

The carryover in sheets at the end of this month will probably be the heaviest of the major products. In most cases arrearages on cold rolled will average two to three weeks.

One mill has blanked out July entirely.

Washington Steel Corp., Washington, Pa., has booked a contract for 115 tons of sheets, two lots, from the mobile air material area, Brookley Air Force Base, Alabama.

Stainless Steel . . .

Stainless Steel Prices, Page 197

A new market has opened up for stainless clad steel. Parish Pressed Steel Div., Dana Corp., Reading, Pa., has an initial run of 1000 stainless clad bumpers for busses made by Mack Trucks Inc., Allentown, Pa.

Stainless clad material is composed of three layers of steel made in the form of a sandwich. Two outer layers are made of stainless steel over a mild steel center. The bumper stock of 0.118 gage, supplied by Allegheny Ludlum Steel Corp., Pittsburgh, is 17.25 in. wide by 108.625 in. long. The Parish organization forms the material in a single stroke on a 132 in., 1000 ton capacity press. The bumper weighs 66 lb when finished.

Steel Bars . . .

Bar Prices, Page 193

Fair orders for third quarter delivery of carbon bars are being placed, but consumers are not going "overboard." While general opinion is that there'll be a steel strike come July 1, there's still the possibility it may be averted before the deadline, and this is sufficient reason for many users to go slow in ordering ahead. Also, since hedge buying no longer is possible, business is slower than it was recently.

Some mills are practically current on shipments, but others are behind a week or so. Arrearages at the end of the month will probably extend more than a week because production is likely to start tapering, especially if no agreement between the steelworkers' union and management seems likely.

A Pittsburgh producer of hot bars expects to operate close to capacity in July if there is no strike and if all his orders stay on his books. New orders alone justify a 60 per cent rate, and the carryover from June will make up the difference. All the tonnage scheduled for June shipment will probably be rolled this month, but it may not be shipped. Barring unforeseen labor problems (slowdowns and wildcat strikes), June shipments should equal or exceed last month's. Although a leading steelmaker could accept more tonnage for July, he's leaving space open so that he can clean up unshipped June orders.

Bookings for August and September are slow. Bar suppliers think August may be the poorest month of the year. Since most consumers have big inventories, sales may not resume their uptrend until October.

A. M. Byers Co., Pittsburgh, has been awarded a contract for 220 tons of chromium-molybdenum alloy bars by the Aviation Supply Office, Philadelphia.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 194

Several major tonnages of steel reinforcing bars are awaiting placement in the Pacific Northwest, but except for some small rush orders,

the market is not particularly active in the district. Producers are stressing the early placement of orders because of the threatened steel strike. One large area plant is not actively seeking new business but is speeding deliveries on old orders.

Tin Plate . . .

Tin Plate Prices, Page 195

Tin plate inventories at mills will be virtually nil by June 30. The product is moving out to canmakers and other consumers about as fast as it is produced. With summer vegetable packs coming on, canmakers can't afford not to be able to satisfy canners' requirements.

Tubular Goods . . .

Tubular Goods Prices, Page 197

Oil country goods producers are sold out for this quarter on specialty joints, high strength alloys, and smaller sizes of tubing and casing.

June shipments (all products) will be about the same as last month's. It's believed consumers will have taken in enough steel by June 30 to meet their July and August requirements. Because inventories will outlast a 60 day strike, users aren't ordering much tonnage for July and August delivery.

Drill pipe remains dormant even though inventories aren't excessive. Steelmakers say these factors may account for the sluggish demand: 1. Independent drilling contractors are still cannibalizing pipe from their idle rigs. 2. To avoid making capital investments (strings of pipe cost from $50,000 to $70,000 each), they're leasing pipe from others at 1 cent a foot per day. 3. Drill pipe is lasting longer; it's being treated to resist corrosion fatigue, and more drill collars are being used. The few new orders being received by the mills specify immediate delivery. One company lost a sale recently because it couldn't promise to ship within a week.

Shipments of standard pipe are expected to be substantially greater this month than they were in May. A lot of last minute buying is probable if a strike appears inevitable. Reason: Jobbers haven't had the financial resources to invest heavily in inventory. Although they have ample inventories of most sizes, mills may not be able to sort all the orders they receive and load

mixed cars in time for shipment before July 1. If a strike is averted, third quarter sales should be as good as those of the second quarter.

Rotary drilling operations in the U. S. declined in the week ended June 1, Hughes Tool Co.'s survey showing 2166 rigs in operation, down 35 from the preceding week but well above the 1803 in the like week of 1958.

Tool Steel . . .

Tool Steel Prices, Page 197

Shipments of tool steel (excluding hollow drill steel) totaled 11,621 net tons in April, reports the American Iron & Steel Institute. During March 9584 tons were shipped and in April, 1958, the total was only 5679 tons.

In the first four months this year the movement amounted to 36,325 tons vs. 23,652 in the like period of 1958.

Structural Shapes . . .

Structural Shape Prices, Page 193

Structural contracting is lagging noticeably in contrast with activity earlier this year when there seemed to be a rush to get work started. It's thought builders, in seeking to beat a possible strike-induced steel shortage this summer, bunched their orders during the spring.

Most of the medium and large fabricating shops are well booked into the fall, and they will have enough steel on hand by the end of this month to keep them going for several weeks. If any supply difficulty is encountered, it will be in wide flange beams.

The small shops also are fairly well booked up, and they are reasonably well fixed so far as steel supply is concerned.

The strike which threatens the mills July 1 also threatens various shops at that time, especially the large captives. However, many others, and particularly where different units are involved, will not be immediately affected when the steel strike deadline is reached. Some shops have contracts that don't expire until Sept. 15 or later. The contract of one eastern fabricator runs until the end of the year.

The severity of foreign competition in some lines again is reflected by an Italian bid for 7000 tons of

The exciting new J & L sets its pace . . .

This LINDE On-site Plant is located at J & L's Cleveland Works. Capacity—48,000,000 cu. ft. mo.

and LINDE helps them keep it!

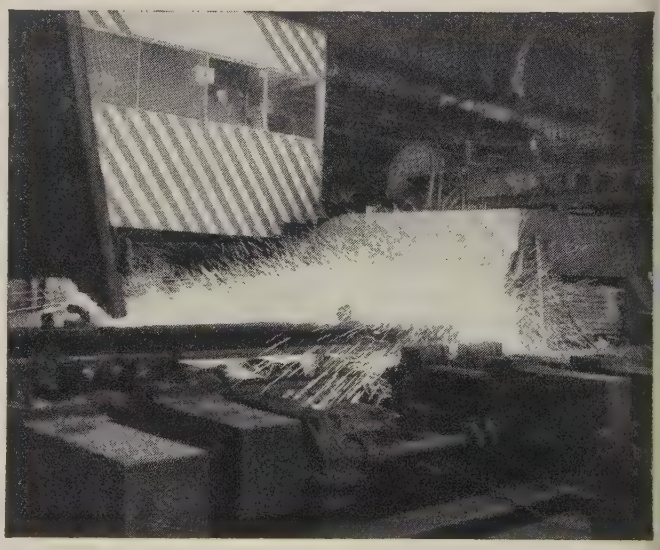
LINDE's Oxygen supply system and scarfing process are geared to production requirements at Jones & Laughlin's Cleveland Works.

All oxygen demands—in the furnace and on the finishing line—are easily handled by LINDE's On-site Plant. BUT . . . intermittent demands require LINDE's flexible supply system—a reliable producing plant PLUS the ability to deliver "peak" and "back-up" requirements from a nationwide liquid oxygen producing and delivery system.

LINDE's supply system and scarfing process meet fluctuations in production as well. When demand dips the oxygen supply is immediately cut back and the LIN-DE-SURFACER Scarfing Machine is regulated or rolled off the line in a matter of minutes.

Whatever the pace set by J & L, LINDE is there right down the line helping to meet the schedule.

For further information, write Dept. S-63, LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in other principal cities. In Canada: Linde Company, Division of Union Carbide Canada Limited.



A LIN-DE-SURFACER Scarfing Machine, like the one shown here, is used by J & L to condition steel destined for the automotive industry.

Linde

UNION CARBIDE

structurals for transmission towers to link the Niagara and St. Lawrence power projects. The New York State Power Authority reports that Societa Anonima Elettrificazione, Milan, Italy, bid $1,371,451 against $2,166,048 by Bethlehem Steel Co. and $2,265,262 by American Bridge Div., U. S. Steel Corp. The Milan firm has been successful in bidding on similar projects in the past.

In New England, the structural shops have curtailed their steel buying. Most of them are covered on the sizes they'll need through the next two months. Less tonnage is being estimated, but bridgework leads current activity in the district.

Distributors . . .

Prices, Page 198

Most steel service centers report continuing improvement in June. It's likely that business will surpass May's—the best month so far this year. One Pittsburgh distributor predicts shipments this month will be 25 per cent greater than last month's.

Part of the pickup is attributed to buying for maintenance and repairs, which will be carried on during the vacation period. Part of the bookings is for filling gaps caused by stringency in mill supplies. Scattered bookings are being made as a hedge against the possibility of a steel strike. Distributors believe they will have sufficient stocks to carry them through July in the event of a walkout at the mills.

Most service centers have adopted the new pricing system, but some have misgivings about it. Distributors generally think the method will work out after customers learn how to order. In many cases, the new system will save them money.

Plates . . .

Plate Prices, Page 193

Third quarter plate buying continues to expand moderately, especially for August and September delivery. Producers have virtually filled July schedules and are running somewhat behind on commitments. If a strike appears inevitable as time goes on, they may enter the third quarter with average arrearages of more than two weeks.

Should a steel strike materalize, orders generally will be pushed back. Should a strike be averted, adjustments in shipping schedules will still be likely since some buyers will ask for deferments and, in some cases, cancellations.

Plate producers are confident of improved business as soon as the labor controversy is settled. Expectations of a pickup in oil and gas requirements are based on expansion plans being developed and on a modest gain in actual orders. Improvement in machine tool and heavy industrial equipment needs is foreseen but tank and boiler requirements are likely to remain spotty for a while. Ship specifications are expected to fall short of the volume reached earlier this year.

Pig Iron . . .

Pig Iron Prices, Page 198

Merchant iron shipments this month probably will be the heaviest so far this year. But vacations and hot weather will sharply restrict the movement in July and have a retarding influence in August.

Some sellers say it probably will be early fall before business returns to present levels. It may even take longer because part of current buying reflects a disposition to build up excess inventories as a hedge against a possible steel strike next month.

The movement of merchant iron on the Great Lakes is fairly brisk and is expected to remain active at least through June.

Sharon Steel Corp. has banked one of its two blast furnaces at the Roemer Works at Farrell, Pa., to work off a surplus of iron. Iron is being shipped from the Shenango Furnace Co.'s Sharpsville, Pa., blast furnace in hot metal cars to Valley Mould & Iron Corp.'s plant at Hubbard, Ohio, to augment supplies furnished by Youngstown Sheet & Tube Co.

Semifinished Steel . . .

Semifinished Prices, Page 193

Inventories of semifinished steel products at the mills are narrowing considerably. Steel is being rolled and shipped faster than had been expected. Unless it is clearly indi-

cated that there will be no strike, the mills shortly will start to withhold steel which can't be completely processed before June 30. For example, coils for sheets can rust if they stand for any length of time. It takes special processing to restore them to rolling condition.

Iron Ore . . .

Iron Ore Prices, Page 199

Iron ore shipments from Steep Rock Iron Mines Ltd., Steep Rock Lake, Ontario, Can., passed the half-million-ton mark in May, a point that wasn't reached in 1958 until August. At the end of May (this season), 506,383 tons had been shipped.

The largest single consignment of ore in the history of the Chesapeake & Ohio Railway was made recently from Newport News, Va., to Ashland, Ky. The shipment (45,500 tons of Canadian ore) was handled in 70 ton coal hopper cars equipped with six wheel trucks. A large number of cars (662) was needed because the ore is heavy. The load limit (70 tons) was reached when the cars were only half full.

Shipments of Lake Superior iron ore in May totaled 12,765,446 gross tons, up 8,704,845 from the 4,060,601 tons shipped in May, 1958, reports the American Iron Ore Association. The season's movement of ore to June 1, totaling 15,745,231 tons, was up 11,622,070 from the 4,123,161 tons moved in the 1958 lake navigation season to June 1 that year.

Shipments of Barrels and Drums Rise 15 Per Cent

Movement of steel shipping barrels and drums in March totaled 2,893,000 units, up 13 per cent from February and 15 per cent from March, 1958, reports the Bureau of the Census. First quarter shipments were 8,058,306 units vs. 7,411,810 in the same period last year.

Shipments of steel pails in March totaled 6,639,223 units, an increase of 22 per cent over February, and 23 per cent over March last year. The total for the first quarter was 17,096,437 units vs. 15,407,539 in the corresponding period last year.

Steel Product Shipments—April, 1959

(Net tons)

Products	Carbon	Alloy	Stainless	First Four Months 1959	1958
Ingots	15,174	14,174	2,056	104,066	98,697
Blooms, slabs	115,732	54,237	1,581	601,966	396,610
Tube rounds	1,381	455	2	6,415	2,787
Skelp	5,349	.....	.....	17,758	29,974
Wire rods	131,250	3,267	1,341	477,491	250,466
Shapes (heavy)	513,488	5,846	18	1,754,962	1,308,919
Steel piling	48,757	.....	.....	138,151	128,141
Plates	638,400	51,989	3,894	2,412,330	1,843,908
Rails (standard)	77,547	.....	.....	300,839	206,634
Rails (other)	5,810	.....	.....	17,062	12,217
Joint bars	4,531	.....	.....	13 982	14,930
Tie plates	22,578	.....	.....	68,355	50,792
Track spikes	7,351	.....	.....	21,260	15,250
Wheels	28,065	50	.....	79,800	68,326
Axles	13,579	51	.....	36,476	38,317
Bars (hot rolled)	641,888	197,724	5,244	2,949,651	1,629,532
Bars (reinforcing)	253,741	.....	.....	765,737	541,570
Bars (cold drawn)	139,511	26,311	6,195	586,792	313,950
Tool steel	2,597	9,024	11,621	36,325	23,652
Standard pipe	274 303	134	.....	896.533	618,678
Oil country goods	236,843	45,638	.....	919.392	381,140
Line pipe	433.215	112	.....	1,189,301	826,719
Mechanical tubing	63,796	30,319	383	318,571	175,813
Pressure tubing	22,906	4,527	1,160	104,235	86,126
Drawn wire	311,520	4,689	3,597	1,044,922	692,980
Nails & staples	46,354	.....	1	149,932	130,270
Barbed wire	7,602	.....	.....	23,207	23,297
Woven wire fence	23,197	.....	.....	68,859	69,084
Bale ties, etc.	5,950	.....	.....	25,087	13,121
Black plate	75,763	.....	.....	254,515	206,028
Tin plate HD	54.906	.....	.....	156,518	141,375
Tin plate—electro	689,998	.....	.....	2,147,241	1,766,939
Sheets HR	915.374	34,632	6,166	3,398.399	1,747,956
Sheets CR	1,502,663	5,358	15,947	5,743,976	2,913,368
Sheets—galvanized	328,759	.....	.....	1,207,151	756,813
Sheets—other	25,181	.....	.....	107,969	51,662
Elec. sheets, strip	6,698	67,724	.....	251,976	148,195
Strip HR	153,821	2,804	2,215	546,588	285,715
Strip CR	122,671	1,788	23,624	506,660	309,696
Total (1959)	7,968,249	560,853	73,424	29,450,450	.....
Total (1958)	4,106,985	232,064	33,922	.....	18,319,547

Data from American Iron & Steel Institute.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

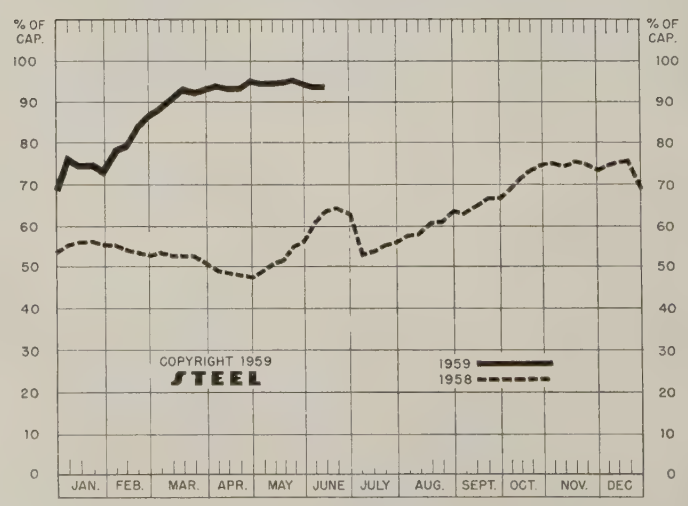
	Week Ended June 14	Change	Same Week 1958	1957
Pittsburgh	97.5	+ 1*	57	88
Chicago	94.5	0*	69	87.5
Eastern	97	+ 1	60	94.5
Youngstown	95	0	50	76.5
Wheeling	90.5	— 0.5	75	83.5
Cleveland	94	0*	45.5	89
Buffalo	107.5	0	53.5	102.5
Birmingham	97	0	60.5	92.5
Cincinnati	95	+ 2.5*	60	88
St. Louis	104	+ 2.5*	95.5	84.5
Detroit	97	— 0.5*	68	99
Western	98	0	72	99
National Rate	94	0	64	88.5

INGOT PRODUCTION‡

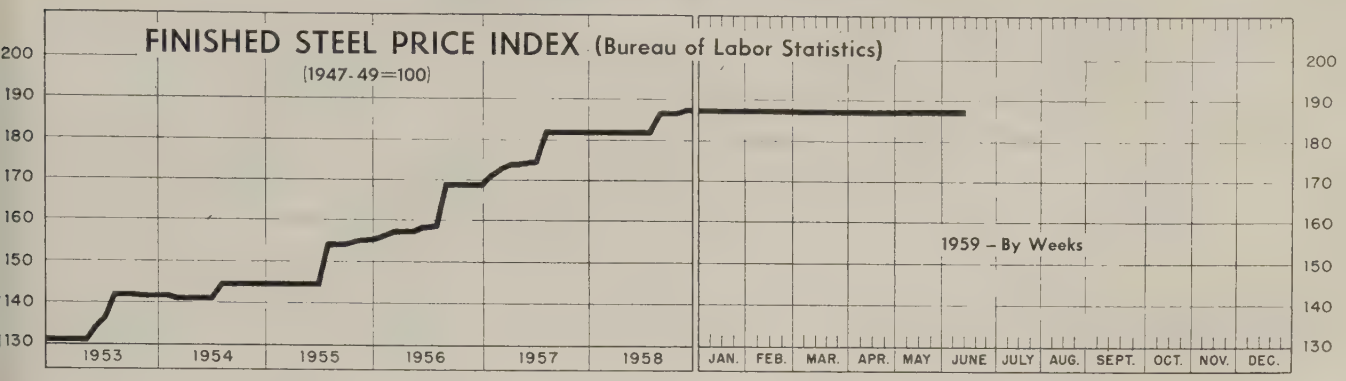
	Week Ended June 14	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	166.9†	165.2	163.8	107.6
NET TONS (In thousands)	2,681†	2,653	2,631	1,728

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



June 9, 1959	Week Ago	Month Ago	May Avg.	Year Ago
186.7	186.7	186.7	186.7	181.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended June 9

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.615
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.658
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.253
		Pipe, Line (100 ft)	199.533
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	27.005
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.665
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.722
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	June 10 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.75
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.52	$113.20
No. 2 Fdry, Pig Iron, GT.	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	35.50	35.00	33.33	35.67	28.17

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	June 10 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.725	4.405
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.10
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.10
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.15-7.25	5.65
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate(1.50 lb)box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods ⅜-⅝" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton

	June 10 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

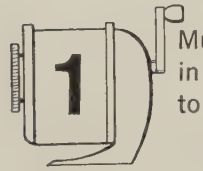
No. 1 Heavy Melt, Pittsburgh	$35.50	$34.50	$34.50	$35.50	$29.50
No. 1 Heavy melt, E. Pa.	36.00	36.00	33.50	34.50	23.00
No. 1 Heavy Melt, Chicago	35.00	34.50	32.00	37.00	32.00
No. 1 Heavy Melt, Valley	39.50	39.50	35.50	36.50	29.50
No. 1 Heavy Melt, Cleve.	36.50	36.50	33.50	33.00	28.50
No. 1 Heavy Melt, Buffalo	33.50	33.50	31.50	26.50	26.50
Rails, Rerolling, Chicago	58.50	58.50	55.50	54.00	44.50
No. 1 Cast, Chicago	50.50	49.50	46.50	41.50	38.50

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

9 WAYS TO SHARPEN YOUR PURCHASING PENCIL

BY BUYING CARPENTER STAINLESS TUBING AND PIPE

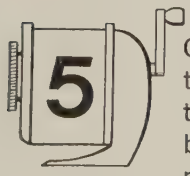


Multiple Lengths. If you order delivery in multiple lengths, you can save up to 3½%.

Selected Mill Lengths. Automatic savings from 2% to 5% if so ordered.

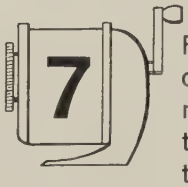
Shorts. If you order 90% of your requirement in cut lengths and 10% in short lengths, you can save 5%.

Standard Tolerances. If you order within published standard tolerance limits, you can save up to 12%; in other words, closer than standard tolerances add 6 to 12% to the cost.

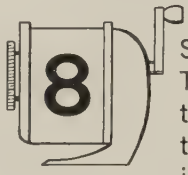


Quarterly Buying. Place your order on the mill for delivery during a specific three month period. This way you will be able to provide material for a three month period and you'll have potential saving through purchasing at a lower cost.

Consider the Next Quantity Bracket. If your requirements for tubing or pipe come close to the upper limits of a quantity bracket, consider future use for this material and jump to the next bracket. Often you will gain several hundred feet of product by jumping to the next bracket at no added per unit cost.



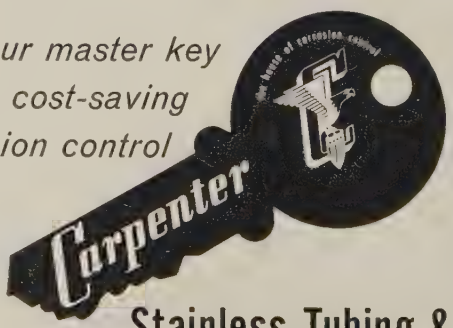
Finish. Recently there have appeared on the market, many conditions of manufacture, ranging from as-welded to full finished. Consider the service to which this tubing or pipe will be applied and consider the few pennies involved for obtaining the best finish compared with the dollars lost by downtime and lost production through use of the cheapest grade available.



Standard Sizes. Carpenter Stainless Tubing and Pipe are made available through a nationwide network of distributors who stock standard sizes, so if you need something quickly you can get it. Don't design equipment, unless it is unavoidable, around other than standard sizes of tubing and pipe.

Performance. To guarantee the greatest operating economy, order from Carpenter. Carpenter WELD-TROL Stainless Tubing and Pipe give you the greatest degree of uniformity available in tubing today. This key factor is your ticket to longer, cost-saving performance. Contact your nearest authorized distributor or write for technical bulletin. The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

your master key to cost-saving corrosion control



Stainless Tubing & Pipe

Steel Prices

Mill prices as reported to STEEL. June 10, cents per pond except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 194; footnotes, page 196.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$76.00

INGOTS, Alloy (NT)
Detroit S41 .....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 .....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
Sharon,Pa. S3 .....82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ...$82.00
Bessemer,Pa. U5 .....80.00
Buffalo R2 .....80.00
Clairton,Pa. U5 .....80.00
Ensley,Ala. T2 .....80.00
Fairfield,Ala. T2 .....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 .....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2..80.00
Munhall,Pa. U5 .....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 .....80.00
Youngstown R2 .....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 .....99.50
Canton,O. R2 .....102.00
Clairton,Pa. U5 .....99.50
Conshohocken,Pa. A3..104.50
Ensley,Ala. T2 .....99.50
Fairfield,Ala. T2 ....99.50
Farrell,Pa. S3 .....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 .....99.50
Geneva,Utah C11 ....99.50
Houston S5 .....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2..99.50
LosAngeles B3 .....109.00
Midland,Pa. C18 .....99.50
Munhall,Pa. U5 .....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 .....109.00
Sharon,Pa. S3 .....99.50
S.Chicago R2, U5, W14..99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ...109.00
Warren,O. C17 .....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 .....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3..126.00
Detroit S41 .....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 .....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 .....119.00
Houston S5 .....124.00
Ind.Harbor,Ind. Y1 ...119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 .....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 .....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 .....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 .....119.00
S.Chicago R2,U5,W14.119.00
S.Duquesne,Pa. U5 ...119.00
Struthers,O. Y1 .....119.00
Warren,O. C17 .....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$122.50
Canton,O. R2 .....125.00
Cleveland R2 .....122.50
Gary,Ind. U5 .....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 .....122.50

SKELP
Aliquippa,Pa. J5 .....5.05
Munhall,Pa. U5 .....5.05
Pittsburgh J5 .....5.05
Warren,O. R2 .....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 .....6.40
Alton,Ill. L1 .....6.60
Bartonville,Ill. K4 .....6.50
Buffalo W12 .....6.40
Cleveland A7 .....6.40
Donora,Pa. A7 .....6.40
Fairfield,Ala. T2 .....6.40
Houston S5 .....6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 .....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 .....6.50
LosAngeles B3 .....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 .....6.40
N.Tonawanda,N.Y. B11..6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 .....6.50
S.Chicago,Ill. R2, W14 .6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 .....6.50
Struthers,O. Y1 .....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 .....5.50
Atlanta A11 .....5.70
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa. B2 .....5.55
Birmingham C15 .....5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Houston S5 .....5.60
Ind.Harbor,Ind. I-2, Y1.5.50
Johnstown,Pa. B2 .....5.55
Joliet,Ill. P22 .....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 .....5.50
Niles,Calif. P1 .....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 .....6.25
Seattle B3 .....6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 .....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.50
Fontana,Calif. K1 ....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 .....5.50
Sterling,Ill. N15 .....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....6.90
Munhall,Pa. U5 .....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 .....8.05
Bessemer,Ala. T2 .....8.05
Bethlehem,Pa. B2 .....8.10
Clairton,Pa. U5 .....8.05
Fairfield,Ala. T2 .....8.05
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 .....8.05
Geneva,Utah C11 .....8.05
Houston S5 .....8.15
Ind.Harbor,Ind. I-2, Y1.8.05
Johnstown,Pa. B2 .....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 .....8.75
Munhall,Pa. U5 .....8.05
Seattle B3 .....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 .....7.75
Struthers,O. Y1 .....8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 .....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 .....8.05
S.Chicago,Ill. U5 .....8.05
Sterling,Ill. N15 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 .....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 .....5.30
Ashland,Ky.(15) A10 ...5.30
Atlanta A11 .....5.50
Bessemer,Ala. T2 .....5.30
Clairton,Pa. U5 .....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 .....5.30
Coatesville,Pa. L7 .....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.30
Farrell,Pa. S3 .....5.30
Fontana,Calif.(30)K1 ...6.10
Gary,Ind. U5 .....5.30
Geneva,Utah C11 .....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 .....5.40
Ind.Harbor,Ind. I-2, Y1.5.30
Johnstown,Pa. B2 .....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 .....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 .....5.30
Newport,Ky. A2 .....5.30
Pittsburgh J5 .....5.30
Riverdale,Ill. A1 .....5.30
Seattle B3 .....6.20
Sharon,Pa. S3 .....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 .....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 .....5.30
Youngstown U5, Y1 ....5.30
Youngstown (27) R2 ..5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....7.05
Fontana,Calif. K1 .....7.85
Geneva,Utah C11 .....7.05
Houston S5 .....7.15
Johnstown,Pa. B2 .....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.95
Ashland,Ky. A10 .....7.95
Bessemer,Ala. T2 .....7.95
Clairton,Pa. U5 .....7.95
Claymont,Del. C22 ....7.95
Cleveland J5, R2 .....7.95
Coatesville,Pa. L7 ....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 .....7.95
Ecorse,Mich. G5 .....7.95
Fairfield,Ala. T2 .....7.95
Farrell,Pa. S3 .....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 .....7.95
Geneva,Utah C11 .....7.95
Houston S5 .....8.05
Ind.Harbor,Ind. I-2, Y1.7.95
Johnstown,Pa. B2 .....7.95
Munhall,Pa. U5 .....7.95
Pittsburgh J5 .....7.95
Seattle B3 .....8.85
Sharon,Pa. S3 .....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 .....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy
Aliquippa,Pa. J5 .....7.50
Claymont,Del. C22 ....7.50
Coatesville,Pa. L7 .....7.50
Economy,Pa. B14 .....7.50
Farrell,Pa. S3 .....7.50
Fontana,Calif. K1 ....8.30
Gary,Ind. U5 .....7.50
Houston S5 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 .....7.50
Lowellville,O. S3 .....7.50
Munhall,Pa. U5 .....7.50
Newport,Ky. A2 .....7.50
Pittsburgh J5 .....7.50
Seattle B3 .....8.40
Sharon,Pa. S3 .....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 .....7.50

FLOOR PLATES
Cleveland J5 .....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
S.Chicago,Ill. U5 .....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 .....6.05
Warren,O. c.l. R2 .....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton,Ill. L1 .....5.875
Atlanta(9) A11 .....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 .....5.675
Canton,O. (23) R2 ....6.15
Clairton,Pa.(9) U5 ..5.675
Cleveland(9) R2 .....5.675
Ecorse,Mich.(9) G5 ....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 .....5.675
Houston(9) S5 .....5.925
Ind.Harbor(9) I-2, Y1.5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ...5.675
LosAngeles(9) B3 ....6.375
Massillon,O. (23) R2 ..6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
N.T'wan'a,N.Y.(23)B11 6.025
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 ....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle A24, B3, N14 ..6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ..5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11..6.375
Warren,O. C17 .....6.025
Youngstown(9) R2, U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.725
Bethlehem,Pa. B2 ....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 .....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 .....6.725
Detroit S41 .....6.725
Economy,Pa. B14 .....6.725
Ecorse,Mich. G5 .....6.725
Fairless,Pa. U5 .....6.875
Farrell,Pa. S3 .....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 .....6.725
Houston S5 .....6.975
Ind.Harbor,Ind. I-2, Y1..6.725
Johnstown,Pa. B2 .....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 .....7.775
Lowellville,O. S3 .....6.725
Massillon,O. R2 .....6.725
Midland,Pa. C18 .....6.725
Owensboro,Ky. G8 ....6.725
Pittsburgh J5 .....6.725
Sharon,Pa. S3 .....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 .....6.725
Warren,O. C17 .....6.725
Youngstown U5 .....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....8.30
Bessemer,Ala. T2 .....8.30
Bethlehem,Pa. B2 .....8.30
Clairton,Pa. U5 .....8.30
Cleveland R2 .....8.30
Ecorse,Mich. G5 .....8.30
Fairfield,Ala. T2 .....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 .....8.30
Houston S5 .....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 .....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 .....9.00
Pittsburgh J5 .....8.30
Seattle B3 .....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 .....8.30
Youngstown U5 .....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 .....5.925
KansasCity,Mo.(9)S5 ..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 .....5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.675
Atlanta A11 .....5.875
Joliet,Ill. P22 .....5.675
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 .....6.52
Seattle B3 .....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 .....6.80
Youngstown U5 .....6.80

BARS, C.F. Leaded (Including leaded extra) Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. P13 .....10.35
Chicago W18 .....10.175
Elyria,O. W8 .....10.175
Monaca,Pa. S17 ....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2.7.65
Birmingham C15 .....8.25
Buffalo B5 .....7.70
Camden,N.J. P13 .....8.10
Carnegie,Pa. C12 .....7.65
Chicago W18 .....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 .....7.85
Detroit S41 .....7.65
Donora,Pa. A7 .....7.65
Elyria,O. W8 .....7.65
FranklinPark,Ill. N5 ...7.65
Gary,Ind. R2 .....7.65
Green Bay,Wis. F7 ....7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 .....8.15
Harvey,Ill. B5 .....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2.9.10
Mansfield,Mass. B5 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 .....7.65
Monaca,Pa. S17 .....7.65
Newark,N.J. W18 .....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 .....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 ....8.10
Struthers,O. Y1 .....7.65
Warren,O. C17 .....7.65
Waukegan,Ill. A7 .....7.65
Willimantic,Conn. J5....8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa.M12,R2 9.025
Bethlehem,Pa. B2 ....9.025
Bridgeport,Conn. C32..9.175
Buffalo B5 .....9.025
Camden,N.J. P13 .....9.20
Canton,O. T7 .....9.025
Carnegie,Pa. C12 .....9.025
Chicago W18 .....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 .....9.225
Detroit S41 .....9.025
Donora,Pa. A7 .....9.025
Elyria,O. W8 .....9.025
FranklinPark,Ill. N5 ...9.025
Gary,Ind. R2 .....9.025
GreenBay,Wis. F7 ....9.025
Hammond,Ind. J5, L2..9.025
Hartford,Conn. R2 .....9.325
Harvey,Ill. B5 .....9.025
Lackawanna,N.Y. B2..9.025
LosAngeles P2, S30 ...11.00
Mansfield,Mass. B5 ...9.325
Massillon,O. R2, R8 ...9.025
Midland,Pa. C18 .....9.025
Monaca,Pa. S17 .....9.025
Newark,N.J. W18 .....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 .....9.20
Struthers,O. Y1 .....9.025
Warren,O. C17 .....9.025
Waukegan,Ill. A7 .....9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ...9.325
Youngstown F3, Y1 ...9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse, Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 .6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ...6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated; To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 ....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ..7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt) B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ...5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ...6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ..5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2 Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2.6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 ....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ...9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill. G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ...6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 .....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 ....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor, Ind. I-2 ...8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel Div., U. S. Steel Corp.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H.K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago,Ill. W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind. Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2, Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. F4	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
Los Angeles C1, S41	9.30
McKeesport.Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975
NewBritain,Conn. S5	7.875

Strip, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Rivedale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C. R. Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425*

*Plus galvanizing extras.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)

IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American

	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, aBse Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Beech Bottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths)

Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)

	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	....	19.70	20.20	20.70 ....
Vandergrift,Pa. U5	..	17.10	18.10	19.70	20.20	20.70 15.70
Warren,O. R2	....	....	....	....	....	.... 15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
N.Tonawanda,N.Y. B11	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
KansasCity,Mo. U3	12.90
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster,Mass.A7,J4,T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C10	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE (A)

Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity,Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16,	12.35
Palmer,Mass. W12	12.65
Pawtucket,R. I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7, T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity, Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S. Chicago,Ill. R2	173
SparrowsPt. Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) To Distributors (33)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
Sparrows Pt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler

(14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago, Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8.	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8.	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
PittsburgCalif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.59

BALE TIES, Single loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8.	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2.	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality (6 to 8 gage) An'ld Galv.

Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48)A11	9.10 9.775§
Bartonville(48) K4	9.10 9.80
Buffalo W12	9.00 9.55†
Cleveland A7	9.00 ....
Crawfordsville M8	9.10 9.80‡‡
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jack'ville,Fla. M8	9.10 9.80‡‡
Johnstown(48) B2	9.00 9.675§
Joliet,Ill. A7	9.00 9.55†
Kans.City(48) S5	9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9.95 10.625§
Monessen(48) P7	8.65 9.35§
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.(48)B2	9.10 9.775§
St'ling(1)(48)N15	9.00 9.70§§
Struthers,O. Y1	9.00 9.65‡
Worcester,Mass.A7	9.30 9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts

Full Size Body (cut thread) & Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer length	35.0

Lag, Plow, Tap, Blank Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts (Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam	50.0
¾ in. diam	47.0
⅞ and 1 in. diam.	43.0
1⅛ and 1¼ in. diam	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy

Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in. incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller.	20.0
¾, ⅞, and 1 in.	+ 5.0

Longer than 6 in.:

⅝ in. and smaller.	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

¾ in. and smaller, 6 in. and shorter +85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam:

6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85, ⅞ in. and smaller by 6 in. and shorter: 15% off list.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$28.95	$43.40	$55.40	$73.00	$95.10
Buffalo W12	28.95	43.40	55.40	73.00	95.10
Cleveland A7	28.95	43.40	55.40	73.00	....
KansasCity,Mo. U3	29.85	43.40	55.40	73.00	95.10
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	28.95	43.40	55.40	73.00	95.10
Pittsburg,Calif. C11	28.95	43.40	55.40	73.00	95.10
Pueblo,Colo. W12	28.95	43.40	55.40	73.00	95.10
Roebling,N.J. R5	28.95	43.40	55.40	73.00	95.10
SparrowsPoint,Md. B2	28.95	43.40	55.40	73.00	95.10
St.Louis L8	28.95	43.40	55.40	73.00	95.10
Waukegan,Ill. A7	28.95	43.40	55.40	73.00	95.10

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....(16)	6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

EAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

ze—Inches	2		2½		3		3½		4		5		6	
ist Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
ounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
liquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
mbridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
rain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
oungstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

LECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

oungstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

UTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

ze—Inches	⅛		¼		⅜		½		¾		1		1¼	
ist Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
ounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
liquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
lton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
enwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
utler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
tna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
airless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
ontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
diana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
rain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
aron, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
aron, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
arrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
heatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
oungstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

ze—Inches	1½		2		2½		3		3½		4	
ist Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
ounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
liquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
lton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
enwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
tna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
airless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
ontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
diana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
rain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
aron, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
arrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
heatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
oungstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

tainless Steel

Representative prices, cents per pound; subject to current lists of extras

ISI pe	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
01	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
02	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
01	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
02	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
02B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
03	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
04	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
04L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
05	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
08	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
09	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
10	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
14	....	....	80.50	....	89.75	94.50	87.75	....	104.25
16	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
16L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
17	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
21	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	65.50
20	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
347-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

roducers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel orp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; abcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip teel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New ngland; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; earborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern tainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel orp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., org-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson teel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainss Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; aryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; idvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; acific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh olling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Comany, Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; monds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel iv., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; imken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; ube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; niversal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products o.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; eymour Mfg. Co.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base Cold Rolled 10%	Strip, Carbon Base Cold Rolled Both Sides
Copper*	$36.20	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa. deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
Granite City,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos.0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglet, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.12	11.92	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.00	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.25	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9 07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Stronton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill. Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Vellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$12.50-13.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 91.5c-96.5c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00†
48% 2.8:1	38.00-40.00†
48% no ratio	29.00-31.00†

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00†

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Canadian Steel

(Cents per pound, f.o.b. mill, except as otherwise noted)

Billets, Blooms & Slabs:	
Carbon, Forging Quality (net ton)	$97.00
Alloy (net ton)	115.00
Wire Rods:	
Carbon, 7/32" to under ¼ in.	5.30
Carbon, ¼ in. to 47/64 in.	5.70
Alloy	6.40
Wire (carload lots)	8.40
Bars & Small Shapes:	
Carbon, merchant quality	5.40
Carbon, special quality	5.85
Alloy	6.40
Bar Mill Bands:	
Carbon	5.40
Alloy	8.05
Structural Size Angles & Zees	5.40
Plates:	
Carbon	5.45
Sheets & Coils, Hot Rolled:	
Carbon Sheets	5.00
Carbon Strip	5.00
Sheets & Coils, Cold Rolled:	
Carbon Sheet	6.35
Carbon Strip (0.080 and lighter)	6.35
Carbon Strip (0.081 and heavier)	6.65
Sheets & Coils, Galvanized:	
Standard Quality	6.70
Culvert Quality	7.00
Sheets, Porcelain Enameling	7.45
Sheets & Coils, Electrical:	
Field Grade	9.00
Armature Grade	9.50
Electrical Grade	10.15
Tin Mill Products (Per Base Box; 100 lb basis wt)	
Coke Tin Plate (1.25 lb pot yield)	$10.60
Electrolytic Tin Plate (0.25 lb coating)	9.10
Black Plate	8.30
Nails, c.l. lots, 400 keg min. (per keg)	$8.15

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.25
100 mesh, pails	9.10§
40 mesh, bags	8.10††
Electrolytic Iron,	
Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	36.00
Unannealed (99+% Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade,	93.00-290.00
in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500-lb drum, freight allowed, cl.	38.50; ton lots 40.50.
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	*34.10-50.70†*
Bronze, 5000-lb lots	*52.20-56.20†*
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	*52.70-57.10†*
Phosphor-Copper, 5000-lb lots	*64.60*
Copper (atomized) 5000-lb lots	*45.10*
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten: Carbon reduced, 98.8% min. minus 65 mesh	Dollars nom.**
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Metallurgical Coke

Price per net ton

Beehive Ovens	
Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50
Oven Foundry Coke	
Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33 95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens: New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes	South Atlantic	Gulf Coast	West Coast
Reformed Bars, Intermediate, ASTM-A 305	$5.80	$5.80	$5.75	$5.65	$6.11
Bar Size Angles	5.30	5.30	5.25	5.10	5.56
Structural Angles	5.68	5.68	5.63	5.53	5.98
I Beams	5.31	5.31	5.31	5.21	5.65
Channels	5.26	5.26	5.26	5.16	5.60
Plates (basic bessemer)	5.65	5.65	5.60	5.50	5.96
Sheets, H.R.	8.30	8.30	8.30	8.10	8.60
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.52	9.52	9.47	9.37	9.83
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	9.58	9.58	9.53	9.43	9.89
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	8.60	9.12
Forming Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.76	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.68	6.68	6.58	6.52	6.75
Merchant Bars	5.90	5.90	5.85	5.65	6.11
Cut-Rolled Bands	7.15	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.70	5.70	5.70	5.50	5.85
Wire Rods, O.H. Cold Heading Quality No. 5	6.30	6.30	6.30	6.20	6.55
Bright Common Wire Nails (§)	7.65	7.65	7.65	7.65	7.95

†per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.	
Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00
Cents per lb, f.o.b. tank cars or tank trucks, deld.	
Phenol, 90 per cent grade	14.75
Per net ton bulk, f.o.b. cars or trucks, plant	
Ammonium sulfate, regular grade	$32.00

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max. P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. Charge Chrome 2: Cr 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. Refined Chrome 2: Si 12% max, 24c. Carload, lump, bulk, per lb Cr.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload bulk 20.05c per lb of alloy, caroad packed, 21.25c, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb or briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo., in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

SEE HOW TENSILES OF SPECIAL HB COMPARE WITH MUSIC WIRE

SIZE	STANDARD HB	*SPECIAL* HB	MUSIC WIRE
.1620	219,000 min.	**249,000 min.**	249,000 min.
.1350	227,000 "	**258,000 "**	258,000 "
.0800	244,000 "	**276,000 "**	282,000 "
.0200	310,000 "	**320,000 "**	350,000 "

—at savings of up to 60%

You can use PAGE *Special* HB for many jobs where music wire has always been specified —and save up to 60% on your wire costs! PAGE *Special* HB is a hard-drawn, high-carbon steel wire, available in diameters from .162″ to .020″ (bright finish). Its tensile strength approaches that of music wire in all sizes — and in sizes .090″ and coarser equals it! Check the chart above for tensile strengths of four typical diameters. If you now use music wire, it makes sense to investigate PAGE *Special* HB; you may be able to reduce your wire costs considerably.

PAGE is a logical source for other types of manufacturers wire, too. Why not see for yourself what PAGE quality wire can do to improve your product and lower your costs. And if you have an unusual problem requiring a special wire PAGE can help you there, too. The latest example of PAGE leadership is the development of ACCO Aluminized Wire; commercially pure aluminum bonded to a steel core.

ACCO

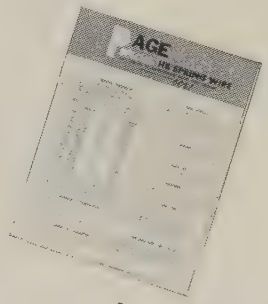
PAGE MANUFACTURERS WIRE

Page Steel and Wire Division • American Chain & Cable Company, Inc.

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Bridgeport, Conn.

WRITE FOR DETAILS

Booklet DH-107A gives complete data on PAGE *Special* HB, including table of tensile strengths, chemical composition, dimensions, finishes, and other information. Write us at Monessen, Pa., for your copy —or for information on any other PAGE wire.



PAGE —the source for answers to wire problems

Scrap Composite Rises Slightly

STEEL's index on No. 1 heavy melting goes up another 50 cents a ton to $35.50, highest since early April. Advance scored in face of spotty demand and threatened steel strike

Scrap Prices, Page 204

• **Pittsburgh**—The market's in its usual midmonth lull, but prices are firm. Dealers are moderately bullish because bids on industrial scrap and railroad lists were about $3 higher than they were a month ago. Some brokers believe No. 1 heavy melting scrap is worth $40 a ton, but they admit that the price can't be substantiated. Small tonnages are moving at $36.

• **Philadelphia**—Except for an increase in short shoveling turnings to $23-$24, delivered, scrap prices are unchanged. Domestic demand is easier, and some steel mills have named June 20 as the cutoff date on incoming shipments should the threat of a strike continue. Export demand tends to bolster the market.

• **New York**—Following an increase on some steel grades a week ago, the market is now unchanged throughout the list. Brokers have enough tonnage under contract to meet current export commitments and are under less pressure from domestic buyers.

Steadiness prevails in the major steel grades and in cast scrap and stainless specialties.

• **Chicago**—The market continues to carry a stronger tone, but lack of buying by the mills tends to offset it. It's reported that No. 1 dealer heavy melting steel sold for $35, No. 1 dealer bundles for $36—up $1 a ton, but the transactions may not be representative.

Little new buying can be expected the remainder of this month, or until it is known if there'll be a strike. Some mills have already announced no scrap shipments will be accepted after June 20.

The cast iron grades are in good demand because the gray iron foundries are busier, and prices are up $1 a ton.

• **Cleveland** — There's not much change in the market. Practically no buying of consequence is expected until after the steel labor negotiations are out of the way. Some steel plants have set June 15 as the deadline for shipping scrap on old orders. They don't want to have to pay demurrage on unloaded freight cars if there is a strike. Some turnings tonnage has been moving to blast furnaces in the Valley.

• **Detroit**—The market is quiet. A Canadian order for specially cut bundles is still unfilled. Chrysler reportedly offered one of the local mills 5000 to 6000 tons of No. 1 bundles for $41 and was turned down. Dealers are split on where the market will go, but the feeling is growing stronger that the end of the month will show a drop in

prices. It seems unlikely that the mills will buy on the eve of a possible strike.

Foundry steel looks like it may be in for a slight tumble. Local foundries were expecting June 1 releases on 1961 auto parts, but they have been held up.

• **Buffalo**—Leading grades of steel scrap are $2 a ton higher as the result of new mill purchases. No. 1 heavy melting is quoted $33-$34 and No. 2 heavy melting $28-$29. Turnings are up $1.

Railroad scrap, low phos, and other specialties are up $2 in sympathy with the rise on the open hearth grades. Cast iron scrap prices remain unchanged.

Dealers attribute the stronger market to a desire by the mills to keep scrap coming into their plants at a steady pace during early June. It's expected the mills will start cutting off deliveries around June 20 if a strike is imminent.

• **Cincinnati** — Scrap is stronger, mainly on broker and dealer sentiment. No. 1 heavy melting is up $1 a ton in broker buying prices to $33.50-$34.50. Increases of $1 to $2 a ton are spotted throughout the lists, with some increases representing broker advances to cover old orders, and overcome dealer resistance.

• **St. Louis**—Scrap prices continue firm. Mills are a little cagey about buying, but seem interested in getting in more scrap. The market may stiffen further and prices show some rise before month's end.

• **Birmingham** — The market is stronger. Dealers are accepting orders at prices that are $1 to $2 a ton higher. A railroad list closed last week $1 to $3 a ton higher on most items. With pressure pipe manufacture rising, the cast scrap market is firm. Brokers say cast prices would be higher were it not for an influx of foreign pig iron, which is being offered at $15 to $20 a ton under domestic prices.

• **Houston**—The supply of country scrap is critically low. Brokers are having difficulty covering Mexican orders and buying for export.

Current orders for both Texas mills expire June 15. The producer at Houston is out of the market until after the steel wage issue is settled. The second Texas mill is reported interested in purchasing additional tonnage at the old price level.

Most Texas foundries hold comfortable inventories, but cast scrap prices are supported by light supplies.

• **San Francisco**—There isn't much scrap moving to the steel mills, but the market is firm at prevailing prices.

• **Seattle** — The market is at a standstill. Large buyers are preparing for mill closedowns at the end of the month, and have notified scrapyards to hold up shipments after June 24. Production and consumption of scrap are down. A strike in the metal trades reduced the scrap turnover by more than 1000 tons last month. Foreign buyers are holding back purchases, awaiting market developments favorable to them in event the domestic steel plants are closed by a strike.

• **Los Angeles**—Because mills will not accept tonnage shipments after June 15, the steel grades are inactive. Prices are steady despite sluggish demand.

Rails, Cars . . .

Track Material Prices, Page 196

If there is a steel strike, freight carbuilders will likely be caught short of supplies first. The railroads placed car orders too late for them to bolster their inventories of light plates and standard shapes. They have had to put incoming shipments into production.

The carriers have been buying more rails this year than last, but the total volume isn't impressive. It's likely the roads will get enough tonnage this year to satisfy their tracklaying programs.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4200 tons, three plants, Bestwall Gypsum Co., Ardmore, Pa., to Mississippi Valley Structural Steel Co., St. Louis; each plant will require 1400 tons, with locations to be announced later.

1174 tons, section of Bruckner Expressway, New York, to Harris Structural Steel Co., New York.

700 tons, New York State bridgework, Syracuse, N. Y., to Harris Structural Steel Co., New York.

320 tons, manufacturing plant, National Gypsum Co., Savannah, Ga., to Steel Products Inc., Savannah; Daniel Construction Co., Birmingham, general contractor.

300 tons, two dormitories, Pembroke College, Brown University, Providence, R. I., to A. O. Wilson Structural Co., Cambridge, Mass.; J. L. Marshall & Sons Inc., Pawtucket, R. I., general contractor; concrete reinforcing bars to Bethlehem Steel Co., Bethlehem, Pa.

240 tons, Garden State Plaza, R. H. Macy, Paramus, N. J., to Elizabeth Iron Works, Union, N. J.

140 tons, high school, Wayland, Mass., to Groisser & Shlager Iron Works, Somerville, Mass.; N.D.C. Construction Co., Boston, general contractor.

STRUCTURAL STEEL PENDING

7000 tons, transmission towers, to link Niagara and St. Lawrence power projects, New York State Power Authority; Societa Anonima Electrificazione, Milan, Italy, is low with bid of $1,371,451 vs. $2,166,048 by Bethle-

(*Please turn to Page* 209)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, June 10, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

June 10	$35.50
June 3	35.00
May Avg.	33.58
June 1958	35.50
June 1954	27.92

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 dealer bundles	38.00-39.00
No. 2 bundles	25.00-26.00
No. 1 busheling	38.00-39.00
No. 1 factory bundles	44.00-45.00
Machine shop turnings	19.00-20.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals:	
2 ft and under	43.00-44.00
3 ft lengths	42.00-43.00
Heavy turnings	30.00-31.00
Punchings & plate scrap	45.00-46.00
Electric furnace bundles	42.00-43.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	45.00-46.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	46.00-47.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	*44.00-45.00*
Rails, 2 ft and under	*57.00-58.00*
Rails, 18 in. and under	*57.00-58.00*
Random rails	*51.00-52.00*
Angles, splice bars	*50.00-51.00*
Railroad specialties	*50.00-51.00*
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	220.00-225.00
18-8 turnings	115.00-120.00
430 bundles & solids	120.00-125.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	35.00-36.00
No. 1 hvy melt., dealer	*34.00-35.00*
No. 2 heavy melting	31.00-32.00
No. 1 factory bundles	41.00-42.00
No. 1 dealer bundles	*35.00-36.00*
No. 2 bundles	24.00-25.00
No. 1 busheling, indus.	35.00-36.00
No. 1 busheling, dealer	33.00-34.00
Machine shop turnings	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals, 3 ft	43.00-44.00
Punchings & plate scrap	44.00-45.00

Cast Iron Grades

No. 1 cupola	*50.00-51.00*
Stove plate	*47.00-48.00*
Unstripped motor blocks	*42.00-43.00*
Cleaning auto cast	*57.00-58.00*
Drop broken machinery	*57.00-58.00*

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
R.R. malleable	59.00-60.00
Rails, 2 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Angles, splice bars	48.00-49.00
Axles	65.00-66.00
Rails, rerolling	58.00-59.00

Stainless Steel Scrap

18-8 bundles & solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	28.00-29.00
No. 1 busheling	39.00-40.00
No. 1 bundles	39.00-40.00
No. 2 bundles	25.00-26.00
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	42.00-43.00
Electric furnace bundles	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00

CLEVELAND

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	25.00-26.00
No. 1 factory bundles	41.00-42.00
No. 1 bundles	36.00-37.00
No. 2 bundles	25.00-26.00
No. 1 busheling	36.00-37.00
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	39.00-40.00
Cut structurals, plates 2 ft and under	43.00-44.00
Low phos. punchings & plate	39.00-40.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	33.00-34.00
Brake shoes	36.00-37.00
Clean auto cast	50.00-51.00
Burnt cast	37.00-38.00
Drop broken machinery	50.00-51.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	125.00-130.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	31.00
No. 1 bundles	37.00
No. 2 bundles	21.00
No. 1 busheling	37.00
Machine shop turnings	14.00
Short shovel turnings	16.00

Cast Iron Grades

No. 1 cupola	50.00
Charging box cast	42.00
Heavy breakable cast	40.00
Unstripped motor blocks	41.00
Clean auto cast	51.00
Stove plate	46.00

Railroad Scrap

No. 1 R.R. heavy melt.	*38.00*
Rails, 18 in. and under	49.00
Rails, random lengths	42.50
Rails, rerolling	*54.50*
Angles, splice bars	45.00

BIRMINGHAM

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	21.00-22.00
No. 1 busheling	*30.00-31.00*
Cast iron borings	14.00-15.00
Machine shop turnings	22.00-23.00
Short shovel turnings	24.00-25.00
Bar crops and plates	*42.00-43.00*
Structurals & plates	*41.00-42.00*
Electric furnace bundles	36.00-37.00
Electric furnace:	
3 ft and under	34.00-35.00
2 ft and under	35.00-36.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	40.00-41.00
No. 1 wheels	*40.00-41.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*34.00-35.00*
Rails, 18 in. and under	*45.00-46.00*
Rails, rerolling	52.00-53.00†
Rails, random lengths	*40.00-41.00*
Angles, splice bars	*43.00-44.00*

PHILADELHIA

No. 1 heavy melting	36.00†
No. 2 heavy melting	30.00
No. 1 bundles	38.00
No. 2 bundles	23.00
No. 1 busheling	37.00
Electric furnace bundles	39.00
Mixed borings, turnings	20.00†
Short shovel turnings	*23.00-24.00*
Machine shop turnings	20.00
Heavy turnings	32.00-33.00
Structurals & plate	40.00-42.00
Couplers, springs, wheels	42.00-43.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	42.00
Drop broken machinery	49.00-50.00
Malleable	67.00-68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	28.00-29.00
No. 2 bundles	16.00-17.00
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00
Short shovel turnings	13.00-14.00
Low phos. (structurals & plates)	36.00-37.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Short shovel turnings	21.00-22.00
Machine shop turnings	17.00-18.00
Short shovel turnings	21.00-22.00
Cast iron borings	19.00-20.00
Low phos structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	48.00-49.00

Railroad Scrap

Rails, random lengths	45.00-46.00
Rails, 3 ft and under	51.00-52.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*33.50-34.50*
No. 2 heavy melting	*28.50-29.50*
No. 1 bundles	*33.50-34.50*
No. 2 bundles	23.00-24.00
No. 1 busheling	*33.50-34.50*
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*17.00-18.00*
Short shovel turnings	*19.00-20.00*
Cast iron borings	*18.00-19.00*
Low phos., 18 in.	*43.00-44.00*

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	*40.00-41.00*
Charging box cast	*39.00-40.00*
Drop broken machinery	*50.00-51.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*38.00-39.00*
Rails, 18 in. and under	*55.00-56.00*
Rails, random lengths	47.00-48.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	*21.00*
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	41.00

Cast Iron Grades

No. 1 cupola	*45.00-46.00*
Heavy breakable	27.00-28.00†
Foundry malleable	*41.00-42.00*
Unstripped motor blocks	*38.00-38.50*

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*26.00*
No. 2 heavy melting	20.00-20.50
No. 1 bundles	*26.00*
No. 1 busheling	*26.00*
Machine shop turnings	8.00-9.00
Short shovel turnings	*11.00-12.00*
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	33.00-34.00
No. 2 bundles	19.00-20.00
No. 1 busheling	31.00-32.00
Machine shop turnings	12.00-13.00
Mixed borings, turnings	13.00-14.00
Short shovel turnings	13.00-14.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Stove plate	35.00-36.00
Charging box cast	36.00-37.00
Heavy breakable	36.00-37.00
Unstripped motor blocks	24.00-25.00
Clean auto cast	50.00-51.00

SEATTLE

No. 1 heavy melting	35.00
No. 2 heavy melting	33.00
No. 1 bundles	27.00†
No. 2 bundles	22.00
Machine shop turnings	17.00
Mixed borings, turnings	17.00
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	35.00
No. 2 bundles	18.00
Machine shop turnings	17.00
Shoveling turnings	19.00
Cast iron borings	19.00
Cut structurals and plate 1 ft and under	49.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	33.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory:	
Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

†Nominal.

‡F.o.b. Hamilton, Ont.

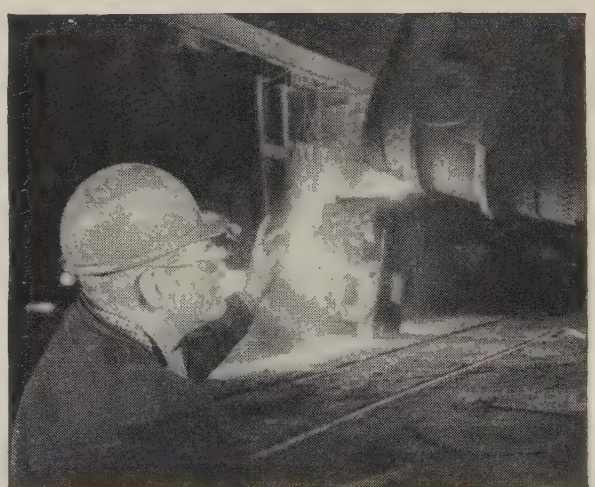
THE U.S. TREASURY SALUTES THE PEOPLE IN THE STEEL INDUSTRY

—who buy Savings Bonds and strengthen America's Peace Power

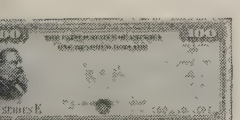
Men and women who earn their living in the steel industry can take great pride in knowing that their crafts and skills contribute, through raw material supplies, to nearly every other great industry in the United States. They can also be proud of the help thousands upon thousands of them are giving to America's Peace Power through the purchase of U.S. Savings Bonds.

Through regular purchase of Shares in America, these thrift-conscious people are reinforcing their own security after retirement, and establishing current reserves for such worthwhile family projects as new homes, education and travel.

If your company has not put in a Payroll Savings Plan thus far, you can start immediately. Just telephone your State Savings Bonds Director and accept the help he wants to give you. Or write to Savings Bonds Division, U.S. Treasury Department, Washington, D.C.



J. K. Thomson is shown here at his work in one of the great steel mills of this country. Like thousands of his fellow craftsmen, Mr. Thomson is making regular use of his company Payroll Savings Plan to contribute to the Peace Power of his country.



STEEL
The Metalworking Weekly

THE U.S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTISM, THE ADVERTISING COUNCIL AND THE DONOR ABOVE.

Mills Cite Import Perils

Brass mill industry calls for tariff help to stop flood of foreign products. Aluminum industry changes shipping policy. April zinc sales zoom. Tantalum price chopped

Nonferrous Metal Prices, Pages 208 & 209

THE DOMESTIC BRASS mill industry has declined since World War II due to U. S. international economic policies, says the Copper & Brass Association.

CABRA reports:

• An "alarming" growth in brass mill imports. (The loss in some markets, such as tubular plumbing goods, is almost 100 per cent.)

• The conversion of the U. S. from a net exporter to a net importer of brass mill products.

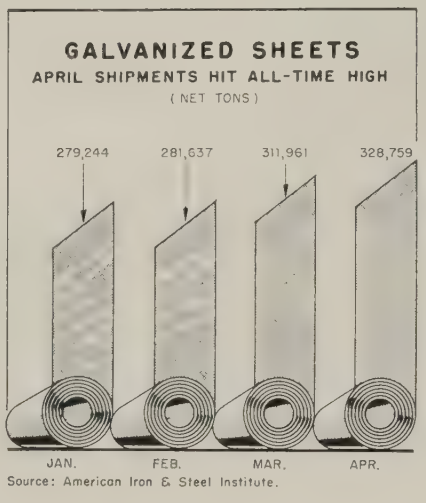
• The gradual displacement of U. S. brass mill labor with foreign labor which is paid only a fraction of our wage rates.

• **Documentation** — Domestic mill production fell from 3.6 billion lb in 1943 to 1.5 billion lb last year, even though capacity has increased greatly in the interim. Between 1949 and last year, imports rose from 21,085,000 lb to 153,948,000 lb. The increase in the ratio of imports to exports has been steady.

The foreign goods are mainly from Britain, West Germany, Canada, and Belgium, says CABRA. Two related factors explain their success in this country: Price and the disparity in wage rates. For example, in 1957 the average U. S. brass mill wage was $2.07 cents an hour compared with 62 cents in Britain, 55 cents in Germany, and $1.67 in Canada.

• **More Woes**—Substitution is also a problem. Metalmen say more than 80 end use products have been replaced or are threatened. They mention screw machine products, bus bars, auto radiators, heat exchanger tubing, and refrigeration tubing. Result: Per capita brass mill shipments have slumped.

The industry thinks expanded research and promotional programs will take care of the substitution problem. For imports, CABRA suggests: "A flexible tariff which would merely equalize the wage disparity between foreign and domestic producers," and a government policy that would "encourage foreign producers to raise the level of their wages to more nearly that of our own."



Source: American Iron & Steel Institute.

Zinc Sales Gain

Heavy demand from galvanizers and automakers keeps the zinc market booming. Zincmen from New York to San Francisco wore smiles last week as they read the American Zinc Institute's figures for May. They showed slab zinc shipments were up 7000 tons (to 85,348 tons), the best showing since last October; producers' stocks were down over 7000 tons (to 196,004 tons), the lowest since January; and production was about even with April's.

Tantalum Price Cut

The price of tantalum has been chopped almost in half. Union Carbide Metals Co. posts a new price of $35 a pound for high purity tantalum melting stock compared with the former quotation of $60. Increased demand, paced by expanded production facilities, is the reason behind the drop.

Change Shipping Rules

The aluminum industry has made another basic change in its marketing policy. Effective July 1, Kaiser Aluminum & Chemical Corp. and Reynolds Metals Co. will sell metal only on f.o.b. destination or customer custody terms.

Previously, it had been the industry's custom to sell pig, ingot, and mill products f.o.b. the plant, with full freight allowance to the destination. It had become common for some customers to call for their orders at the producing plant, which in certain cases amounted to price discounting.

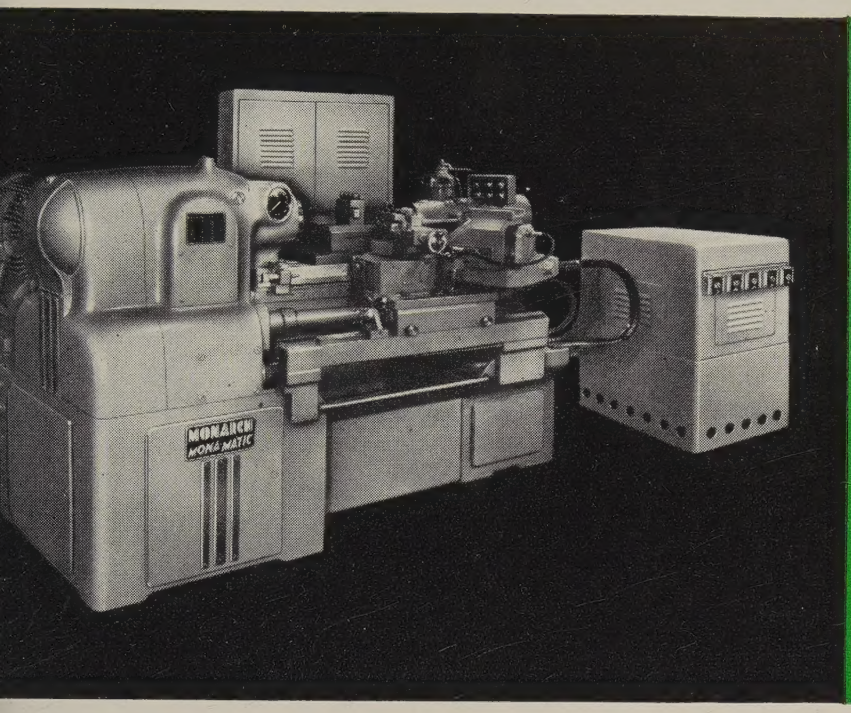
Says Kaiser: "The allowance of freight in connection with pickup of materials at our plants has been abused by means of questionable trucking arrangements and other practices. These are becoming more common and frequently lead to inequities to those customers who do not or are unable to pick up at our plants."

NONFERROUS PRICE RECORD

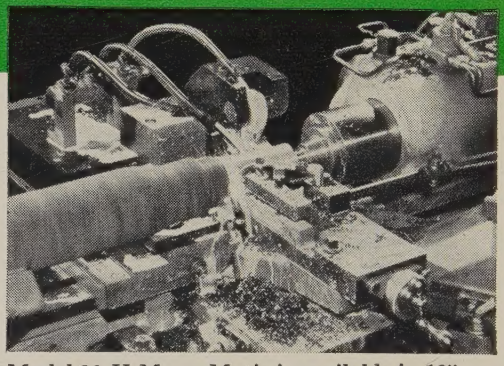
	June 10 Price	Last Change	Previous Price	May Avg	Apr. Avg	June, 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.000
Copper	31.50–32.00	Apr. 30, 1959	31.50–32.50	31.750	32.404	25.400
Lead	11.80	May 7, 1959	11.30	11.700	10.992	11.040
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	104.75	June 10, 1959	105.00	103.080	102.490	94.701
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig 99.8%, Velasco, Tex.

Don't Tool Up for Tomorrow's Boom with Yesterday's Lathes



MONARCH'S HIGH PRODUCTION LATHES OF TOMORROW...



Model 20-H Mona-Matic is available in 18", 30" and 42" center distance. Swing over bed is 15"; over front slide and rear slide ways, 8". Bed ways are flame hardened and ground.

4..The New Model 20-H Mona-Matic—A Low First Cost Production Lathe

Take a good look at what we've done to the Mona-Matic concept of production turning. This new machine

(1) *Carries a low price tag, because of simplified design*

(2) *Has fast hydraulic feed and traverse movements, making it exceedingly productive*

(3) *Is a dependable day after day performer, requiring only routine maintenance for years of trouble-free service*

The Model 20-H is a fully automatic double carriage turning machine, with a 60° "Air-Gage Tracer" controlled front tool slide. A variety of automatic cycling arrangements provides high productiveness and versatility. Eight spindle speeds are available by pick-off gears in each of three standard ranges. The tailstock has an air actuated spindle and inbuilt, heavy duty, anti-friction center.

Front carriage feed rate is infinitely variable from 1" to 40" per minute; traverse is 200" per minute. Rear slide feed rate is ½" to 40" per minute while traverse is at 90" per minute.

Four different feeds are available to the carriage. Either a one or a two cut cycle can be furnished. Two cut cycle machines are provided with a selector switch for one or two cut operation.

Imagine better performance at lower cost these days! Why not let us set up a demonstration on your parts? *The Monarch Machine Tool Company*, Sidney, Ohio.

Monarch
ACCURACY • ECONOMY • LONG LIFE
TURNING MACHINES

IF IT CAN BE TURNED, THERE'S A MONARCH TO DO IT BETTER AND FASTER

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 31.50 deld.; custom smelters, 32.00; lake, 31.50 deld.; fire refined, 31.25 deld.

Germanium: First reduction, less than 1 kg, 41.00 per gram; 1-10 kg, 37.00 per gram; intrinsic grade, 35.00-37.00 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 100 lb, $11 per lb; 100-500 lb, $9.50 per lb; 500 lb or more, $9 per lb. All prices deld.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $241-243 per 76 lb flask.

Molybdenum: Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $2.00-2.20 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 104.75.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.50; No. 5, 14.25 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.875-26.25; No. 12 foundry alloy (No. 2 grade), 22.75-23.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy, 0.60 Cu max., 24.75-25.00; 195 alloy, 26.25-27.00; 108 alloy, 23.25-23.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 22.50; grade 3, 21.25; grade 4, 20.75.

Brass Ingot: Red brass No. 115, 30.25; tin bronze, No. 225, 41.25; No. 245, 35.00; high-leaded tin bronze, No. 305, 34.50; No. 1 yellow, No. 405, 24.75; manganese bronze, No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.855; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	....
0.136-0.096	43.20-48.30	....
0.126-0.103	....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	....
0.077-0.061	....	39.50-40.70
0.068-0.061	44.30-52.20	....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 24.50-25.00; No. 2 heavy copper and wire, 22.50-23.00; light copper, 20.50-21.00; No. 1 composition red brass, 18.75-19.25; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 31.50c)		
	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	55.63b	52.86c	....	55.82	27.500	27.500	26.750
Yellow Brass	48.24	32.73d	48.78	51.65	20.625	19.750	18.750
Low Brass, 80%	51.23	51.17	51.77	54.54	23.250	23.000	22.500
Red Brass, 85%	52.29	52.23	52.83	55.60	24.250	24.000	23.500
Com. Bronze, 90%	53.90	53.84	54.44	56.96	25.125	24.875	24.375
Manganese Bronze	56.54	50.14	60.62	....	19.125	18.875	18.375
Muntz Metal	50.85	46.16	....	....	19.375	19.125	18.625
Naval Brass	52.80	46.61	59.36	56.21	19.125	18.875	18.375
Silicon Bronze	60.67	59.86	60.21	78.35	27.000	26.750	26.000
Nickel Silver, 10%	63.82	66.15	66.15	....	25.500	25.250	12.625
Phos. Bronze	75.34	75.84	75.84	77.02	28.625	28.375	25.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

sition turnings, 17.25-17.75; new brass clip-gs, 17.50-18.00; light brass, 12.75-13.25; avy yellow brass, 13.25-13.75; new brass rod ds, 14.00-14.50; auto radiators, unsweated, 50-15.00; cocks and faucets, 14.75-15.25; ass pipe, 15.00-15.25.

ad: Soft scrap lead, 7.75-8.25; battery ates, 2.25-2.50; linotype and stereotype, 9.25-75; electrotype, 7.75-8.25; mixed babbitt, 5-10.25.

onel: Clippings, 30.00-32.00; old sheets, .00-28.00; turnings, 20.00-22.00; rods, 30.00-.00.

ckel: Sheets and clips, 52.00-54.00; rolled odes, 52.00-54.00; turnings, 39.00-40.00; rod ds, 52.00-54.00.

nc: Old zinc, 3.25-3.50; new diecast scrap, 00-3.25; old diecast scrap, 1.75-2.00.

uminum: Old castings and sheets, 11.50-.75; clean borings and turnings, 7.25-7.75; gregated low copper clips, 14.75-15.25; segre-ted high copper clips, 14.25-14.75; mixed low pper clips, 15.00-15.50; mixed high copper ps, 12.25-12.75.

(Cents per pound, Chicago)

uminum: Old castings and sheets, 12.25-.75; clean borings and turnings, 10.00-10.50; gregated low copper clips, 17.25-17.75; segre-ted high copper clips, 16.25-16.75; mixed low pper clips, 16.50-17.00; mixed high copper ps, 15.75-16.25.

(Cents per pound, Cleveland)

uminum: Old castings and sheets, 11.50-.75; clean borings and turnings, 10.75-11.25; gregated low copper clips, 15.75-16.25; segated high copper clips, 14.75-15.75; mixed w copper clips, 15.25-15.75; mixed high cop-r clips, 14.25-14.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

eryllium Copper: Heavy scrap, 0.020-in. and avier, not less than 1.5% Be, 57.50; light rap, 52.50; turnings and borings, 37.50.

pper and Brass: No. 1 heavy copper and re, 27.00; No. 2 heavy copper and wire, .75; light copper, 23.50; refinery brass 0% copper) per dry copper content, 25.25.

INGOTMAKERS' BUYING PRICES

pper and Brass: No. 1 heavy copper and re, 27.00; No. 2 heavy copper and wire, .75; light copper, 23.50; No. 1 composition rings, 21.50; No. 1 composition solids, 22.00; avy yellow brass solids, 16.00; yellow brass rnings, 15.00; radiators, 17.50.

PLATING MATERIAL

f.o.b. shipping point, freight allowed on antities)

ANODES

dmium: Special or patented shapes, $1.30.

pper: Flat-rolled, 47.79; oval, 46.00, 5000-,000 lb; electrodeposited, 40.50, 2000-5000 lots; cast, 43.00, 5000-10,000 lb quantities.

ckel: Depolarized, less than 100 lb, 114.25; re, 27.00; No. 2 heavy copper and wire, .00; light copper, 23.75; refinery brass de-ct 3 cents a lb.

n: Bar or slab, less than 200 lb, 123.50; 200-9 lb, 122.00; 500-999 lb, 121.50; 1000 lb or re, 121.00.

nc: Balls, 18.00; flat tops, 18.00; flats, .75; ovals, 20.00, ton lots.

CHEMICALS

dmium Oxide: $1.30 per lb in 100-lb drums.

romic Acid (flake): 100-2000 lb, 31.00; 2000-,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,-0 lb or more, 29.50.

pper Cyanide: 100-200 lb, 65.90; 300-900 63.00; 1000-19,900 lb, 61.90.

pper Sulphate: 100-1900 lb, 15.30; 2000-5900 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 12.80; 23,000 lb or more, 12.30.

ckel Chloride: 100 lb, 45.00; 200 lb, 43.00; 0 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, .00; 10,000 lb or more, 37.00.

ckel Sulphate: 5000-22,999 lb, 29.00; 23,000-,990 lb, 28.50; 40,000 lb or more, 28.00.

dium Cyanide (Cyanobrik): 200 lb, 20.80; 0-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 or more, 17.80.

dium Stannate: Less than 100 lb, 81.20; 100-0 lb, 71.70; 700-1900 lb, 69.00; 2000-9900 lb, 10; 10,000 lb or more, 65.80.

annous Chloride (Anhydrous): 25 lb, 156.80; 0 lb, 152.00; 400 lb, 149.50; 800-19,900 lb, 8.70; 20,000 lb or more, 102.60.

annous Sulphate: Less than 50 lb, 141.90; lb, 111.90; 100-1900 lb, 109.90; 2000 lb or re, 107.90.

ic Cyanide: 100-200 lb, 59.00; 300-900 lb, 00.

(Concluded from Page 203)

hem Steel Co., Bethlehem, Pa., and $2,265,-262 by American Bridge Div., U. S. Steel Corp., Pittsburgh.

2000 tons, Bomarc launcher projects, Washington and Oregon; bids to U. S. Engineer, Seattle, July 7 and July 9.

1400 tons, Hamilton Ave., municipal incinerator, Brooklyn, N. Y., Sovereign Construction Co., Ft. Lee, New Jersey, low on the general contract.

1124 tons, state bridgework, Mercer County, New Jersey, bids July 1; 565 tons of reinforcing steel also required.

1050 tons, state bridgework, Henrico and Hanover Counties, route 54, Virginia.

940 tons, state bridgework, Lebanon, Bosrah, and Norwich, Conn., bids closed June 8.

910 tons, mostly angles, General Stores Supply Office, Navy, Philadelphia; bids June 15.

860 tons, Cougar Dam, Oregon; bids in to U. S. Engineer, Portland, Oreg.

629 tons, Grace Institute, Lexington Ave. and E. 75th St., New York, project withdrawn.

476 tons, bridge and approach work, Central Railroad of New Jersey, Woodbridge, N. J., bids June 19.

390 tons, gymnasium, Riverdale School, Bronx, New York, bids closed.

360 tons, Idaho state highway span, Pocatello; general contract to LaGrande-Johnson Co., Salt Lake City, Utah.

335 tons, state bridgework, Hudson County, New Jersey, bids June 25; 112 tons of reinforcing steel also required.

REINFORCING BARS . . .

REINFORCING BARS PLACED

270 tons, high school, Wayland, Mass., to Joseph T. Ryerson & Son Inc., Boston; N.D.C. Construction Co., Boston, general contractor.

120 tons, Mountlake, Wash., high school, to Bethlehem Pacific Coast Steel Corp., Seattle; Brazier Construction Co., Seattle, general contractor.

100 tons or more, two elementary schools, Lawrence, Mass., to Barker Steel Co., Boston (reinforcing), Manuel Greenberg Co., Lawrence (structurals); Vara Construction Co., Boston, general contractor.

REINFORCING BARS PENDING

1225 tons, Cougar Dam, McKenzie River, Oregon; Merritt-Chapman & Scott, New York, low at $23,985,564 to U. S. Engineer, Portland, Oreg.

835 tons, General Stores Supply Office, Navy, Philadelphia; bids June 15.

656 tons, state bridgework, Mercer County, New Jersey, bids July 1; 1124 tons of structural steel also required.

380 tons, high school, La Salle College, Montgomery County, Pa.; bids asked; 320 tons of structurals also required.

218 tons, also lump sum for unstated structurals, Montana state highway overpass; bids to Helena, Mont., June 17.

215 tons, I-beam bridge, Waterville, Maine; bids June 17, Augusta, Maine.

125 tons, two girder bridges, Douglas County, Oreg.; bids to Bureau of Public Roads, Portland, Oreg., June 18.

112 tons, state bridgework, Hudson County, New Jersey; bids June 25; also 335 tons of structural steel required.

PLATES . . .

PLATES PENDING

560 tons, steel sheet piling, also 24,400 ft of 16 in. steel pipe piling, and 36,600 ft of 20 in. prestressed concrete piling; bids to Commission of Public Works and Docks, Portland, Oreg., July 2.

100 tons or more, water tank for Kennewick, Wash.; American Pipe & Construction Co., Portland, Oreg., low bidder at $28,900; alternatives also bid.

100 tons or more, 500,000 gal water tank, Corvallis, Oreg.; American Pipe & Construction Co., Portland, Oreg., low bidder at $21,850.

RAILS, CARS . . .

RAILROAD CARS PLACED

Pennsylvania Railroad, 600 piggyback cars, 300 to Pullman-Standard Car Mfg. Co., Chicago, and 300 to ACF Industries, New York.

Advertising Index